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PETROLEUM.

NOTES OF A VISIT TO THE NEW PETROLEUM REGION OF SOUTHWESTERN PA.

We take the following from the *American Exchange and Review*, for October.

Dear Sirs:—In accordance with your instructions, I left Philadelphia on the 5th inst, and proceeded to Pittsburgh, thence to Uniontown, Fayette county, from which place I was in the kindest manner conveyed to Dunkard creek, on the Monongahela, by Dr. Fuller, of Uniontown. I was informed while in Uniontown, that parties were engaged in boring for oil within 4 miles of that place, but with what success I am unable to say. The drive across Fayette county to the Monongahela revealed most extraordinary coal deposits. The outcrops occurred frequently on the high roads, and through extensive tracts. The rapid rate at which we travelled rendered it impossible for me to notice the formations with sufficient accuracy to determine as to the oil bearing qualities of the land.

The approach to the Monongahela revealed a more suggestive state of things. On the Greene county side what the operatives call "surface indications," are present in several localities. Such indications as oil floating on the river and creeks increase on the approach to Dunkard creek, along the river road, from Greensborough until you arrive at the creek itself, and are similar in appearance to the surface indications of Oil Creek.

Just before coming to the mouth of the creek, not only the surface indications increased, but the character of the formations gave evidence of oil bearing land such as shales impregnated with bituminous matter, rising to the surface, etc.

On entering the road leading up the creek, the formations in several instances showed evidences of the presence of oil. At the Gapin Farm the appearances were unmistakable—the water at the depth of a very few feet showed oil very distinctly. On this farm a well is being bored at a point which would seem favorable for the search. Above the Gapin farm, on the other side of the creek, is a well from which some oil has been obtained, and several other borings were in progress in the immediate vicinity.

On our arrival at the Mapel farm, about 3 miles from the mouth of the creek, we saw several wells in working order. One of these wells, at the depth of 300 feet had yielded oil at the rate of 17 barrels per day—the well then ceased to yield, and the owners bored to 600 feet, with little success. At the distance of perhaps 20 feet from the well, in the creek, the water in several places bubbles up continually, showing the liberation of a large amount of gas from the deposits of oil in the vicinity.*

Although this can scarcely be regarded as a favorable indication for the adjacent well, it is a most favorable indication of the presence of oil in large quantities at some neighboring point. So large an amount of gas, flowing perhaps for a long time, argues the presence of large deposits of bituminous matter, and that bituminous matter is evidently undergoing decomposition, with loss of hydrogen and some portion of carbon.

But if further evidence of the oil-bearing qualities of the land were needed, it is furnished most amply by another well, perhaps 150 yards south of the one just mentioned. This is called the Wiley well. In boring this well, oil was struck at 300 feet; the boring, however, was continued to the depth of 610 feet, when it commenced to yield at the rate of 40 barrels per day. At the time of my visit, it was yielding at the rate of 100 barrels per day. The stream of oil and salt water which issues together is perhaps 2½ inches in diameter, and upon examination proved to be in nearly equal proportions of oil and salt water. This oil is of an amber color, and I am told yields 95 per cent. of refined oil. The oil of Oil Creek does not yield more than 65 per cent. Within a few feet of this well, another well was sunk to the depth of about 6 feet, for the purpose of procuring fresh water, when oil commenced running at such a rate that the operatives were able to dip more than a barrel per day from it. This would show the extent to which the land is saturated with oil. The land in this locality has that dark, fatty appearance characteristic of oil territory. The flat on which the Wiley well is situated runs nearly north and south. The dip of the rock is southeast. In addition to the advantage of the superiority of the oil of Dunkard over that of Oil creek, there is abundance of coal, A 9 feet vein of coal runs through the hills immediately opposite to Mapel farm, on which the Wiley well is situated at a distance no greater than 70 or 80 yards from the well. Coal traverses the hills up the Dunkard for several miles, and there is perhaps no spot whereon a derrick is likely to be erected, where the coal will be at much greater distance. This must give the operator here a very decided advantage.

The Dunkard region presents a wild, broken appearance, with steep, high hills, and occasional flats, which are usually selected as sites for the erection of machinery, and where the oil is most abundantly found. In travelling up the Dunkard, above Mapel farm, the surface characteristics were numerous and very marked, and but little trouble was found in distinguishing the oil-bearing lands. Our journey extended to Taylortown, some 3 or 4 miles south of Mapel farm, and along its whole length spots could be pointed out as affording evidence of oil. Indeed, so far as appearances, such as the strata, the formations, and the superficial position of the shales go, I am inclined to think that the land on Dunkard and other streams tributary to the Monongahela, will be found but little inferior to Oil creek at the head waters of the Alleghany in profusion of supply.

I much regretted the absence of a barometer and my chemical tests. On the journey up the creek, the dip of the rocks is southeast, in the direction of the river, and affords no apparent evidence of volcanic action. I found, indeed, two instances of slight interruption in dip near the Maple farm, such as occur in Venango county, but not of sufficient extent to indicate serious volcanic disturbance. The reports of several eminent gentlemen had led me to expect evidences of upheaval, denoting violent and extensive volcanic disturbance; but on the journey from Pittsburgh to Uniontown, and thence along the Monongahela to Dunkard, a distance of over 92 miles, the strata possessed that ponderous, quiet, horizontal position so favorable to the deposition of vegetable matter, and formation of coal or oil.

Some geologists have contended that petrolem was a result of a distillation, going on in the shale beds several miles beneath the earth's surface; that this substance was condensed and held in fissures in the rocks formed by volcanic action ages agone, where they say it has remained until liberated by the hand of man. How large must be the fissure from which a flowing well, yielding 3000 barrels of oil per day for one year, obtains its supply.

But singularly opposed to this hypothesis is the fact that evidences of volcanic action are abundant on the eastern slope of the Alleghanies, near the localities of the anthracite basins, while on the western, the strata for many miles preserves a quiet, unbroken appearance. This appearance of the rocks is preserved along the Youghagany, the Mononghahela and the Alleghany, with scarcely a perceptible change. It is true that in some places, boulders in groups with massive rocks detached from primitive formations, are seen high up in the hills, but examination discloses the rounded edges peculiar to rocks in the beds of rivers, which denote rather the action of running water than volcanic disturbance; and their location can be attributed to nothing but the ordinary effects of that element coursing in one direction for ages. In one place, in formations the same as those of Dunkard, I found a fossil vine as thick as a thumb, with branches perfect, under the first sand-rock and on top of the first shale. This sandstone is a deposition made by running water; its thickness could not be less than 20 feet, and this again from 10 to 40 feet beneath the surface of the soil. This sand rock and this soil have all been deposited over the shale in which the vine first fell.

It fatigues the imagination to conceive of the lapse of time since the feathered denizen of the woods sat upon this vine, and clarioned his challenge to the foe, or warbled his love song to his mate—countless ages before the bark canoe glided past these wild hills, guided by the red daughter of the forest. And yet these strata are unbroken—not a vestige of volcanic action to be seen. Does not this simple vine furnish us a hint of the manner in which the vegetable matter, from which oil is derived, is deposited? Is it not obvious that the tissue has been deposited in the localities where it now exists as oil, and that the different deposits of sand-rock and shale have taken place over it—that this woody matter has drifted from the mountains and dropped on its passage—the difference being that the deposit under the thin sand-rock is much greater than those under the first and second—that these deposits, in addition to the vegetable growth of their period, have changed to oil as the mud changed to rock or shale. Formations of this kind are known to exist all over the earth, and as evidences of these tracts having been once water-courses are abundant, why should they not occur here.

In the decomposition of vegetable matter, the first

*While superficial appearances are not to be held as conclusive evidences of concentration of oil in the depths below or near, yet their significance should not be altogether discarded. The oil at Mecca, Ohio, was discovered in 1860, by Mr. Wood, who, dining at a hotel, observed a film of oil upon the surface of a glass of water standing by his plate. He immediately bought the well and the ground from which it came, and drilling, struck the oil vein at the depth of fifty feet.

step is an oxidation, thus: If 3 equivalents of wood, 1 of carbon, will absorb 2 atoms of oxygen from 2 atoms of water, and form 1 of carbonic acid—the remaining 2 atoms of carbon will combine with the 2 atoms of hydrogen liberated from the water, and form petroleum—while the liberated oxygen and hydrogen of the wood combine together and form water. In this view we can readily account for the existence of this substance in large basins. It is no uncommon thing for wood to accumulate in vast masses, such as the Red river raft, several leagues in extent. This wood will be intermixed with mud, and in some cases form an island, which, in the lapse of ages, on the subsidence of the waters, will leave extensive beds of coal or oil. The modification depending upon the favorable conditions for the formation of coal— in other words, it will make coal or oil, according to the free access of water and atmospheric air.

Now the surface lands in this vicinity afford conclusive evidences of their inequalities having been occasioned rather by running water than by volcanic action and it requires no great stretch of the imagination to conceive of the large amount of woody matter which must have floated over that section in the descent from the mountains, nor is it to be wondered at that portions of this wood should have lodged in different localities, and lain there, while deposits of a different character were made over it—each layer of sandstone seems to have covered a period of vegetable growth—and the fact that small quantities of oil are found running from the hill sides, is evidence that oil is making from the accumulation of leaves, twigs and branches every day.

Yours, &c., INVESTIGATOR.

PETROLEUM COMPANIES.

In the vast area of our territory, whose mineralogical and geological features and surface indications offer plausible reasons for the existence of petroleum, the field of speculative oil operations would appear to be unlimited. The great Appalachian bituminous coal field offers its oily wealth to the lucky borers who can strike the exact spots, beside streams, in proximity to the less carboniferous of the coal beds, and the present excitement bids fair to leave none of the region unexplored—that is, where there is available transportation—for the drillers are even now at work almost in sight of the rebel bayonets. To say nothing of the expansive but more superficial coal measures of the northwest, the Appalachian coal field presents at least 60,000 square miles for experiment. This region extends south by west from northwest Pennsylvania, near the state line, and, following the Alleghanies, as its eastern border, embraces the central and southwestern part of Pennsylvania and southwestern Ohio; also, West Virginia and southwestern Virginia, with eastern portions of Kentucky and Tennessee and northeastern Alabama. Perhaps, two thousand borings are in progress now on both sides of the Ohio, and the reports that come daily—even after their exaggerations are reduced—will stimulate more, for as we write, we hear of a well yielding a thousand barrels per day struck in the Horse Neck. Midway between Venango and the Kanawha lies the great and almost untouched district of Greene and Fayette counties, Pa., where, once developed, in the estimation of practical oil men, Dunkard creek will rival Oil creek, and the Big Sandy will excel the Allegheny.

Whatever want the next twelve months may bring, the want of a sufficiency of oil companies will not be likely, therefore, to occur. So far, the increase of product by new wells has not more than kept pace with the falling off in the yield of old ones, and, consequently, over-production has not intervened to darken the hopefulness which gilds the enterprise. It pays richly to strike oil, and the chance to be one who shall succeed where 10 or more shall fail, still lures on alike the winners and the losers in the lottery.—*American Exchange and Review.*

INSTRUCTIONS FOR BURNING PETROLEUM.

The following instructions relating to the use of these oils for lighting purposes in Paris, have been approved by the Prefect of the Seine and published:

As there is danger in the use of petroleum, it is important that the public should be made acquainted with the precautions by which this may be avoided. Petroleum, properly purified, is almost colorless. The litre should weigh not less than 800 grammes. It should not at once take fire on being brought into contact with a lighted body. This essential condition may be easily tested: a small quantity of oil should be poured into a saucer, and the surface touched with a lighted match. If the petroleum has been deprived of the light and very inflammable oils, it will not only not take fire if a lighted match be thrown into it, but the match itself, after burning an instant will be extinguished.—All mineral oils intended for lighting purposes which will not stand this test, should be rejected as extremely dangerous Petroleum, even when deprived of the very light spirit called Naptha, which renders it inflammable in contact with flame, is, nevertheless, one of the most inflammable materials known. If poured on linen cloth or woolen fabrics its inflammability is greatly increased, and great care is needed in its storing and sale. It should be kept or carried in metal vessels only, and the stores where it is placed should be lighted either by outside lamps or safety lamps. A lamp for burning petroleum and this class of oils, must have no cracks or flaws in the parts surrounding the wick.—The receptacle for the oil should be sufficiently large to hold more than enough oil for each burning, so that the lamp may not become empty whilst burning. Transparent receptacles, such as glass or porcelain, are to be preferred, as the quantity of oil contained may be seen. The receptacle should be thick, and the adjustments should be fixed on it, not merely by tight fitting, but by means of some cement not affected by the mineral oil. The stand of the lamp should be heavy, and with a broad base, to insure steadiness and render it less liable to be upset. Before lighting a lamp it should be completely filled and then carefully closed. When the oil is nearly come to an end the lamp should be extinguished and allowed to cool before it is opened for refilling. In case, however, it is necessary to fill the lamp before it is quite cool, it is absolutely essential to keep carefully at a distance any light which may be wanted during the operation. If the glass of the lamp breaks, it should be extinguished at once, to prevent the heating of the fittings, for such a heating may be sufficiently intense to vaporise the oil in the receptacle; the vapor may take fire ending in an explosion, destroying the lamp and scattering in all directions a liquid at all times inflammable, and frequently in an inflamed state. The best materials for extinguishing these oils when burning, are sand, earth and ashes, and very superior to water.

PETROLEUM IN WESTERN VIRGINIA.

The most important well thus far fully tested is the "Newton well," on Cow run, about eight miles from Marietta, bought of Newton & Co., and now owned by the Bergen Oil Company. It yields, at present, about twenty barrels of oil per day, and in all, has produced about twenty thousand barrels.

The whole of Cow run is regarded by experienced judges to be very valuable for mining purposes. It heads against Newell's run, and empties into the Little Muskingum.

Duck creek, which empties into the Ohio a mile above Marietta, is regarded as a very fine oil region. There are now four paying wells on the borders of this stream. One of these—the "Reckard well"—is over seven hundred feet deep. It may be considered the most satisfactory oil well either in Ohio or Virginia, for, although its yield is not large, it demonstrates beyond doubt that deep oil as well as surface oil abounds in this formation, and that wells of an enduring nature may safely be expected hereabouts.

The M'Farland well, on Cow run is also a deep well—over seven hundred feet deep,—and yields oil of superior quality. The Virginia and Ohio Petroleum Mining Company, too, have a paying well on Cow run.

An oil well was struck a short time since, on the bank of the Ohio—the "O'Neal well" at the mouth of Newel's run—which is expected to do a very fine business. Should it hold out, when tubed it will be a great acquisition to the oil resources of the country, as it will prove that oil may be found near navigable streams without the "draw back" of hauling.

The Pawpaw "oil territory," some fifteen miles east of north from Marietta is to a large extent, leased or purchased by companies and individuals from the East. Though as yet but little tried, it has many favorable indications connected with it. Several very shallow wells have yielded oil in considerable quantities. The Virginia and Ohio Petroleum Mining Company has a large amount of territory in this region, and is now setting an engine to a well from which great results are expected.—*Wheeling Intelligencer.*

WHAT IT COSTS TO SINK AN OIL WELL.

We notice in many of the new oil companies now, being formed that the money laid aside for the development of the property rarely exceeds $20,000, while in many instances it does not amount to more than $10,000. That our readers may understand the extent of the development to be expected from a fund of the amount stated, we subjoin a statement of what it costs to sink a single well six hundred feet deep, the depth to which is now found necessary to go to secure success. Here are the items:

One engine, 10-horse power, delivered on the premises	$2,100 00
Derrick, complete	150 00
Walking beam, sansom post, and appurtenances	50 00
Bill wall, band, wheel and belting	150 00
Overset tools	300 00
1 1-4 inch hawser and 1 1-4 inch hand-pump rope	150 00
600 feet tubing, at 95 cents	570 00
50 feet driving pipe	350 00
500 bushels coal, at 60 cents	300 00
Two engineers, say 60 days each, at $3 50	420 00
Contract to drillers, 600 feet, at $2 25	1,350 00
One pumping barrel and valves	37 50
Two wrenches, at $10 each	20 00
One clamp	5 00
Two 2-inch gas-tongs	15 00
Total	$6 067 50

To this add $500 for contingent expenses, such as accidents in breaking machinery, getting tools fast in wells, and the charges by professional tool extractors, etc., and there will be less than $3,500 left of the $10,000. It will thus be seen that, where it is intended to put down a number of wells, as proposed by so many of the new companies, there must be a larger reserve fund, or the stockholders will have to foot the bills.—*Pittsburg Chronicle.*

PRODUCTION AND APPLICATION OF PETROLEUM.

At a recent meeting of the Polytechnic Association of the American Institute, Dr. Rowell exhibited a glass model, illustrating the apparatus recently introduced in the oil region for raising petroleum. By the present mode, after a hole some 4 or 5 in. in diameter is bored through the earth down to the oil, a pipe is introduced with a pump near the bottom, and the oil is thus pumped out. In some cases the pressure of gas upon the surface of the liquid forces the oil nearly up to the surface, and it is in these cases that the new apparatus is employed. A second pipe is introduced into the hole, with its lower end bent upwards, so as to enter the lower end of the first pipe. Air is then forced by an air-pump down through the second pipe into the lower end of the first pipe, and as the bubbles rise along this pipe they so reduce the weight of the liquid column that the pressure of the gas raises it to the surface, and thus a constant flow is secured. Dr. Rowell's apparatus consisted of two glass tubes immersed part of their length in water, with the lower end of

one tube bent up and entering the lower end of the other. On blowing into the bent tube, the weight of the aqueous column in the other tube was so reduced by the bubbles of air that the pressure of the water outside of the tube forced the water within the tube to the top, and it overflowed. The President remarked that this plan would require a larger expenditure of power than the pump, as the friction of an air-pump is very great. Dr. Rowell suggested as a counterbalancing consideration that with the pump motion must be imparted at every stroke, not only to the long line of pump-rods, but also to the whole liquid column, while with this air-pump arrangement the flow of oil would be constant. There would, therefore, be less expenditure of power in overcoming inertia. Mr. Page stated that the leather of which his boots were made was curried with petroleum in place of the fish oil usually employed, and that, though a year old, it had shown no signs of cracking. He observed that many leather dealers thought petroleum made the leather tougher than fish oil. In reply to a question, he continued that the averaged cost of refining petroleum is about 5 cents per gallon, besides the loss or shrinkage, and that this ranges from 10 to 40 per cent. With respect to petroleum candles, he remarked that he had compared the candles made of Marietta paraffin with the best sperm candles, and their superiority was very marked. They are just about as hard as lead, and remain perfectly solid and dry in the hottest climates.—*London Paper*

MINING.

THE UNDERGROUND ENGINE OF THE GOULD AND CURRY.

In company with Mr. Bonner and Mr. Wm. M. Lent, an old Washoeite and a gentleman well acquainted with the mines of the Territory, we repaired to the lower tunnel and began our journey into the heart of the mountain, or rather into its roots. The main tunnel, along which we proceeded, lighted by our candles, is large and well constructed. It is about half-a-mile in length and runs nearly due west under the base of Mount Davidson. Through the greater part of its length it is cut through rock sufficiently firm to obviate the necessity for timbering, and it is not until the eastern portions of the vein are cut that a regular system of timbering was commenced. Owing to the fact of lime, magnesia, and kindred minerals entering largely into the composition of our leads, which slake and swell upon being exposed to the action of the atmosphere, timbering is nearly everywhere found necessary as soon as vein matter is reached. As we proceeded along the tunnel we met several cars loaded with ore, which rushed past us as we stepped aside at railroad speed, and at length, when in some hundreds of feet, our ears were greeted by the whizzing of steam. Looking ahead, we saw the tunnel filled with white clouds of vapor, through which candles were dimly shining, each encircled by a halo like that about a stormy moon. Through the white mist, dark and indistinct, we could see the figures of men coming and going, almost persuading us that we were approaching the secret laboratories and workshops of the gnomes. Shortly after we stood beside a large steam drum, and were told that we were now at the point where the steam is brought down from the boiler, two hundred and one feet above. The steam-pipe comes down through a shaft, enters the drum, thence runs along the tunnel eight hundred and ninety-nine feet to the engine, which is over four hundred feet below the surface of the mountain. There is a steam-gague affixed to this drum, one at the boiler and another at the engine. The difference in the pressure at the boiler and at the engine, as shown by the gagues, is but five pounds, which is a very slight loss when we consider that the steam is carried through eleven hundred feet of pipe. At the Almaden Quicksilver mines, where the steam is carried through thirteen hundred feet of pipe, the difference in the pressure at the boiler and engine is fourteen pounds. At the Gould & Curry works superheated steam will shortly be used, when the low pressure by condensation will be still less than at present. The steam-pipe passes along the bottom of the tunnel at one side and rests in wooden boxes, where it is surrounded with ashes tightly packed about it. The steam pipe at the Almaden mines passes along the roof of the tunnel, and is merely wrapped with ropes of straw. We noticed but one or two slight breaks in the whole of the long string of pipe between the engine and the steam-drum at the shaft. The pipe is furnished with expansion joints, which slide together and draw apart, like the joints of a telescope, as the pipe is expanded by heat or contracted by cold. This expansion and contraction is very considerable in so long a pipe. Proceeding along the tunnel we presently came to the mouth of the new underground engine shaft and examined a new apparatus for dumping the bucket into the cars, but this we will speak of presently. The engine room is ten or fifteen feet above, and is reached by a ladder and steps leading up from the tunnel. On ascending the ladder and steps we suddenly found ourselves in the engine room, with the huge engine resting before us, hissing impatiently to exert its mighty strength. The engine room is cut out of the solid rock, and the walls and ceilings are supported by a compact frame-work of heavy timbers. It is 42 by 22 in size. Lamps were placed in rows about the walls, and threw a bright, glaring red light through the moist atmosphere of the place, upon the ponderous machinery and upon the workmen, who, like the kobolds of old supposed to keep guard over veins of precious metals, flitted to and fro in the sweltering chamber. Once the engine was started, a circulation was produced which made the air of the place much more comfortable. The steam from the engine escapes into some upper chamber of the mine; therefore is productive of no inconvenience in the engine room. The engine works smoothly, and produces but little noise even in this echoing cavern. The friction wheels of the hoisting gear are ten feet in diameter, being, we believe, the largest in the territory. After the engine was started the hoisting gear was tried, the bucket being lowered and raised, and the brakes and everything pertaining to the apparatus were found to work to perfection. The bucket used is constructed of iron, and is a huge affair, holding over a tun. The bucket is dumped into the cars by means of a simple apparatus, operated by a workman who is in attendance for the purpose. The principal feature of this dumping apparatus is a stout iron bar, which as the bucket ascends is placed in such position as to catch it by the bottom when it descends, and turn its contents into the car. With this dumping apparatus the danger of accident is much lessened. The main engine shaft is now down nearly two hundred feet. The influx of water is very slight, and is productive of no inconvenience. The depth below the surface attained at the bottom of this shaft is over six hundred feet. A working level is being opened at the depth of one hundred feet from the top of this shaft, and another will soon be commenced at its bottom. Mr. Bonner had sent one of the men away on a mysterious errand, and about the time we had completed our examination of the various works, the man made his appearance with a huge basket well stored with champagne, glasses and everything needful for a "refreshing season"—even the ice had not been forgotton. We drank success to the new engine, to the man who sat it up, to the Washoe mines, and to all else that we could think of deserving of success, being aided in this laudable work by the engineers and all the workmen in the vicinity, whom Mr. Bonner called up to assist on the occasion. There was to us something exceedingly novel in this inaugural jollification away down in the bowels of the earth —the dark, silent dominions of the guardian genii of the precious ores of silver and gold. Had we been alone, we should have been in momentary expectation of being startled by the appearance of a chattering troupe of gnomes and gnomides, bursting out from some of the creviced walls, and claiming the right to join in the feast. But as it was, although we may have seen double, we saw nothing supernatural. After finishing the wine, we mounted into an empty car, and with Mr. Lent for our *compagnon du voyage*, were shot out through the long tunnel at railroad speed. The grade of the track is such that a car runs out without pushing. A workman stood behind the car on a sort of platform, and acted in the capacity of conductor. It was really quite an exciting ride. The wind rushed against our faces, the roar of the car wheels resounded in our ears, and as we sped along we could see the square white pannel of light which marked the mouth of the tunnel each moment grow in size. In one place we saw a man on the track; our conductor gave a shrill whistle, the traveler stepped aside, and we darted past him at such a rate of speed that we were unable to decide positively in regard to a suspicion that the lone traveler was an overgrown gnome. We soon stood at the mouth of the tunnel, winking in the glare of daylight like the owls, and here we rest.—*Territorial Enterprise.*

IMPORTANT COAL DISCOVERY.—Robert Brown, the Commander and Government Agent of the Exploring Expedition in Vancouver Island, writes on 25th August, from the Punk ledge river, Comones county, as follows:

About 5 miles further up (from the mouth) a considerable river (named Brown's river) debouches into the Courtenay, flowing from the west. On this river I am fortunate enough to be able to report the existence of the finest seams of coal hitherto discovered, at least as far as the outcrop may form a criterion, on the Pacific coast. About 3¼ miles up the river is the most important seam of coal. This seam is about five feet thick on the outcrop, and about 100 feet is exposed. It dips into the river. Four smaller seams are exposed lower down the river, and vary from 2 to 5 feet in thickness, but I have no doubt but that they are continuations of one seam. In some parts of the seam the coal is 8 ft. thick, but taking the mean depth it may be stated at 5 feet. On the opposite bank of the river from the end of the large seam is a seam 90 feet long and 8 feet thick of pure good coal. The coal can be traced all the way down in seams of various thickness, in some places about the canon of this river from 4 to 6 feet in thickness. I think you will agree with me that this is a very rich coal field, surpassing even the Harwood Company's claim, as it is no farther from the sea than their pits. The outcrop is better than their first indications, and the country equally well adapted for a railway, while Port Augusta, (Comox Harbor,) would form an excellent depot, backed by the splendid farming lands of the Comox Valley.

DEATH OF SIX MINERS AND INJURY OF SEVERAL OTHERS.—A terrible accident happened on the 4th inst., at the red ash colliery of George H. Potts & Co., near Minersville, which resulted in the death of six miners and injury of several others who attempted to rescue them. It seems that on Wednesday afternoon the miners made a blast in one of the breasts to cause a fall of coal. The fire, by some means, communicated to the combustible matter in the mine, driving the miners out of the mine. On Friday six miners, named Thos. Richards and David Williams, Welshmen; Joseph Bearman, a German; Robert Duffy, Michael Finney and Michael Scully, Irishmen, went into the mine to clear away the rubbish. Their prolonged absence created alarm and fear that something had happened to them, and other miners sent in to see what was the matter were prostrated by the noxious gas that filled the place, and were with difficulty dragged alive from the mine. Finally, on Saturday morning, the dead bodies of the six men named above were found and taken from the mine. The Coroner held an inquest on Sunday last, and a verdict was rendered that the deceased came to their deaths from suffocation. All of the unfortunate men were steady, industrious miners, and some of them leave families. Scully was the father of twenty-one children by one wife.—*Pottsville Miner's Journal.*

COAL DISCOVERY AT NOOTKA SOUND.—The Colonist says:

Mr. Robinson, mining engineer, and formerly Superintendent of the coal mines at Nanaimo, and two others, having recently discovered a valuable seam of coal

in the neighborhood of Nootka Sound, have applied to the Government for a grant of a lease for the same, and as they appear to have complied with the terms of the Governor's proclamation of June 11th, relative to such matters, we understand their claim has been granted. The seam is said to be about 6 feet thick, and the quality is represented to be superior to any yet found on the Island. The largest ship in the navy can lie in safety within 20 yards of the seam, in a fine, capacious and well sheltered harbor.

WASHOE'S BLACK DIAMONDS,

It is now an established fact that Washoe has beneath her surface a mineral which will turn out to be quite as valuable and permanent as her gold and silver ores. The commerce and manufactures of modern times have shown, after all, that "Coal is King," and that the country which possesses this article has within herself a source of wealth which will give her a commanding and important position. In these days of steam navigation and development of manufacturing industry in this part of the world, the importance of such a discovery can hardly be over rated. It is therefore with great pleasure that we notice that last week the Newcastle Coal Company sold two tons of Washoe Coal, and if we may credit the opinions and certificates which have been furnished, it is of a very superior quality. It is said to ignite freely, and leaves a soft, white ash, with no clinkers, and of course, as a matter of economy, far surpasses wood. We are therefore in hopes that before long all the mills and other machinery now in use in Washoe will be driven by its means, and that thus an additional aid for the development of the immense resources of that region will have been found.

If these coal mines should prove to be extensive, California will undoubtedly share in so great a blessing, for although the difficulty of transpotation to our frontier would be great indeed, yet many years cannot elapsed before we have railway communication with Virginia City, and the discovery itself will tend to facilitate the completion of such an enterprise. San Francisco alone will ever be a first-rate market for its disposal, for, as we all known, it is an article of constant and indispensable utility.

The coal and iron of England have made her what she is, and in that country colossal fortunes have been made by many of those engaged in the coal trade, the most remarkable of whom is a Welsh coal-owner who, some fifty years back, was a clerk in a timber merchant's office at a salary of $5 a week, and who now can raise and ship 2,000 tons of coal per day. Depend upon it, there is money made by these Black Diamonds.

The largest coal-pit in the world is in Wales, near Merthyr Tydvil, which measures eighteen feet in diameter and 1,110 feet in depth and turns out 1,000 tons a day. Its expenses thus far have been $750,000, exclusive of wagons, etc., $200,000. The ground is of a very difficult nature, the layers often extending fifteen feet without a bed, crack, fissure or any opening whatever. The rock had all to be blasted with gunpowder. The resources of the seam are comparatively boundless, the property extending seven miles in length and three miles in width, covering from 4,000, to 5,000 acres of "four foot coal." May the time not be far distant when we may have to chronicle the existence of such a mine in Washoe! Why should we not? Have not our mineral resources proved to be boundless and varied? All hail, therefore, say we to the "Black Diamonds of Washoe!"—*San Francisco Argus.*

We take the following law decisions from the *London Mining Journal.*

Advances by Directors for Necessaries.—If a company has incured a dept for necessaries supplied to it, then, whatever may be the extent of its borrowing powers, any director or shareholder is justified in paying off that debt; and if he does so, has, in equity, a claim to contribution from the other shareholders. This equity is, however, postponed to the claims of regular creditors of the company. Vice-Chancellor Wood, thus decided in the case of Lowndes *v*, the Garnett and Mossley Gold Mining Company of America (Limited). His honour said no company which carries on business as a going concern, involving a large current expenditure, can so use any provisions in its Deed of Settlement, which fix the amount of its capital and calls or limit its borrowing powers, as to relieve itself from liability to creditors who have supplied labour or materials to carry on the business of the company. The only effect of such provisions is, that if the borrowing powers have been exhausted the directors are disabled from borrowing money on the scurity of the company; in other words, if persons advance money to pay off these debts they cannot acquire the rights of creditors against the compainy. But the company is not the less bound to pay these debts.

—Payment of Dividends out of Capital.—The illegality of paying dividends or interest out of capital has been established by decisions both in the Court of Chancery and the common law courts. The latest cases on the subject are Mcdougall *v* the Jersey Imperial Hotel Company (Limited), before Vice-Chancellor Wood at his last sittings, and Bale *v*. Cleland, tried before Mr. Baron Martin at the last Guildford Assizes. In the former case the Vice-Chancellor restrained, by injuction, the payment of interest out of capital, and a case was referred to where directors were compelled to replace dividends so improperly paid. In the other case (Bale *v*. Cleland) Mr. Baron Martin said:—"The law directs that directors may, with the sanction of the company in general meeting, declare a dividend to be paid to the shareholders in proportion to their shares; but no dividend should be payable except out of the profits arising from the business of the company, and therefore it is the bounden duty of the directors—indeed, I do not believe that the shareholders could legally make a dividend, for it is the directors who are to make it—it is their bounden duty, if a dividend is declared otherwise than out of profits to refuse to pay it, and if necessary, to appeal to the Court of Chancery to restrain its payment."

Trade Marks.—The case of Moet *v*. Couston came lately before the Master of the Rolls upon a question as to the right to an account of profits in the case of a pirated trade mark. The defendants had purchased from a wine merchant in London a wine which was branded as "Moet's Champagne," and which they believed to be the genuine champagne of the plantiffs. It, however, turned out to be spurious. The Master of the Rolls granted an injunction against the defendants, restraining the future sale of it; but held that an injunction in such a case—namely, where a person had innocently bought and sold as genuine a spurious article with a pirated trade mark—did not carry with it a right to an account of profits. His Honour said, if a person manufactured goods himself and put upon them the trade mark of another, though he did not know to whom the mark belonged, he must at laest know that he had himself no right to the mark, and this knowledge would make him liable to an account of profits; but if a man bought as genuine from a third party goods which were spurious, then, until he had been told that such goods were spurious, he was guilty of no fraud, and liable to no account.

Non-liability of Contributory.—In*re* the Exhall Coal Mining Company (Limited), a Mr. Miles had applied for 200 shares in a company, and paid 500*l*. for a call on them. He subsequently wishes to diminish his liability, and proposed to the directors to treat the 500*l*. as paid in respect of fifty fully paid-up shares. This proposal was acceded to, and he received a certificate for fifty paid-up shares. No call was made or dividend paid in respect of the remaining 120 shares. Mr. Miles afterwards discovered that his name continued on the register for 200 shares, and applied to the directors to have the register put right. The directors declared the 150 shares forfeited, as no call had been paid. It was held by the Master of the Rolls, under these circumstances, that Mr. Miles was not liable as a contributory for more than fifty shares.

COAL IN CHINA.

The China Mail describes some coal pits being about five miles north from Kuhshankan up a steep ravine or woody opening in the main valley, the path to them rough and stony in the extreme. There are about fifteen shafts open, each of their entrances being enlarged into a room where the colliers sleep and eat at times, though more comfortable dwellings have been built for overseers and contractors. We engaged a miner to show us down the largest shaft, which measured on the average only 4 1-2 ft. high by 5 ft. wide. It is cased with willow sticks in a secure manner, and the roof is particularly well guarded. The bottom is lined with the same to form a ladder up and down which the miners travel in their daily labor. This shaft is about 150 ft. deep, and the ladder down to the digging is perhaps 600 ft. long. The coal is secured on small wooden sledges, and drawn as the miner slowly crawls up along the narrow and slippery step by a strap passing over his forehead, each load weighing 80 cathes. One workman brings up six loads as his day's work.—The sides of this shaft showed the widths of the veins of coal, but the top and bottom were not dug out. The whole was very dry, owing, probably to its elevation up the hill, but some shafts have been abandoned from wet and bad air, and their mouths closed. The laborers are hired out by contractors, who sell the coal to the dealers coming from Pekin and elsewhere. It is all carried away on the backs of camels or mules, and it is a painful sight to see the unwieldy camels coming down the rocky, uneven road bringing their loads of coal. It is delivered in Peking at about three piculs for a dollar, and a large part of the price is for carriage. The coal is hard, but such examination as the time afforded disclosed not a vestige of stump or leaf to compare with the fossils of other coal regions. More careful research will doubtless bring to light some indications of this kind, enabling scientific men to compare the numerous deposits of soft and hard coal in this part of China with the European coal measures.

COAL IN NEVADA TERRITORY.

A large vein of very superior coal has been found by the Daniel Low Coal Mining Company, in their claim on the Truckee river, about twenty-five miles from Virginia City. This is one of the most important discoveries yet made in Nevada Territory, for upon the question of fuel depends, in a great measure, the future prosperity of perhaps all the leading mining enterprises in that region. Wood on the other side of the mountains, convenient to the settled districts, is becoming scarcer and dearer every day, and already, as we are informed, mill operations have been more or less retarded in consequence of difficulty in obtaining sufficient and regular supplies for the furnaces. The Daniel Low Coal Company's works are under the direction of R. H. Bartlett, Esq., a gentleman of much experience and ability, one who, in fact, has devoted the chief portion of his life time to the opening and management of coal mines, and to him will belong the credit, when the company deliver their coal to consumers (which it is believed they will be able to do in the course of two or three months), of contributing almost incalculable benefit to the mining interest of the Pacific coast. Fuel is now, more than ever, indispensably requisite in the continued development of the vast wealth of Washoe, and the Daniel Low Company, for the successful prosecution of their present undertaking, will both deserve and receive substantial success. The vein of the Daniel Low is over eight feet thick, and will, it is expected, yield coal in greater quantity than was ever produced by any other vein in this country.

GAS.

ON A NEW METHOD OF GAS-ANALYSIS.

By A. W. Williamson, F.R.S., and
W. J. Russel, Ph. D.

(*Continued from our last.*)

We now proceed to describe the method of using the apparatus and the precautions to be be attended to. When filling the trough with mercury, care should be taken that air does not remain lodged under the caoutchouc pad; also, that the pad and neighbouring parts are well wetted, so as to prevent air being sucked in in the manner before described; in fact, it is best to fill the trough first with water and then pour in the mercury; this process also wets thoroughly the end of the small caoutchouc tube, into which the glass one is fastened; if this is not attended to, a leakage might take place here in the same manner as at the laboratory vessel. The flexible tube connected with the reservoir should also be well wetted before filling with mercury, and a little water always kept on the mercury in the reservoir; for if this is not done and the tube becomes dry, air cannot pass along it, and, in time, may find its way into the laboratory vessel. The suction tube is easily filled by first filling the laboratory vessel, and then opening the clamp at the bottom of the glass tube, and the clamp on the reservoir tube may also be opened at the same time if necessary to drive the last bubbles of air out. A wide-mouthed bottle, or any other convenient vessel of that kind may be used to catch the mercury as it flows from the suction tube, the end of which should always be kept below the surface of mercury. A convenient arrangement is to have a Wurtemberg syphon, one limp of which dips into this bottle, so as to retain the proper amount of mercury in it, and the other limp passes into a second vessel. The mercury flowing down the suction tnbe runs first into the bottle and then along the syphon into the other vessel. When this mercury is again required, the vessel containing it is removed from below the syphon and the mercury poured out of it into the upper reservoir. When the trough and tubes are properly filled, the mercury should be dried, the end of the syphon tube closed by the caoutchouc cap, and a vacuum formed in the laboratory vessel. This should be left for some hours, then the cap removed from the end of the syphon tube, and the laboratory vessel filled with mercury. This expels through the syphon tube all the air or water which has been sucked in. It may be necessary to repeat this processs two or three times, in fact until, after leaving the vacuum for twelve or fourteen hours, it is found that nothing more than an exceedingly small bubble of air has entered. The apparatus should always be put to this very severe test before using it. When not in use it is well to keep the surface of the mercury wet.

The telescope or rather magnifying glass, used in observing the height of the mercury, consists of a single convex glass set in a tube. The opening at which the eye is placed is small; this avoids any appreciable error from parallax. Within the tube are two fine platinum wires crossing in the centre at right angles. The straight brass rod about 2ft. 3in. long carrying the telescope, is fixed into a heavy stand provided with three levelling screws; this rests on the table which supports the mercury trough. The telescope is fastened to a short arm fixed to a brass tube 6in. long, which clasps the vertical rod, and to prevent this tube having any lateral movement, the ends of it have a slit cut in them, so that they act as a spring, an arrangement similar to that used with the pressure tube and before described. A small ring provided with a screw passing through it also slides on the rod, so that it can be fixed to the rod at any point. The tube carrying the telescope rests on this ring, and is free to move in a horizontal plane. We can thus read off the height of the mercury in the eudiometer and pressure tube. These tubes being close together, the angle through which the telescope has to move is small. The focal length of the magnifier used should be 6in. or 8in.

Let us, now, suppose a gas introduced into the eudiometer, and the cylinder filled with water; the volume of the gas is read off in the following way:—The pressure tube is raised or lowered by means of the clamp or rod attached to it, so as to bring the mercury in it about to the level of the lower edge of the horizontal marker which is to be used; next the eudiometer is adjusted in the same kind of way, so that the column of mercury in it is about the same height as that in the pressure tube; the telescope is then adjusted to the proper height; and directed to the mark behind the pressure tube, the mercury raised or lowered, as the case may be, by giving a screw movement either up or down to the glass tube, dipping into the mercury at the end of the trough. The tube is simply held by a clamp fastened into the table, and moves it with considerable friction. By this means, while looking through the telescope, the mercury in the pressure tube may, with the greatest accuracy, be made exactly to touch the bottom of the horizontal mark, which thus forms a tangent to the meniscus. The readings off are rendered much more certain, and are accomplished with much greater ease, if a screen of silver paper is placed at a short distance behind the apparatus, and in front of the source of light, which may be either an Argand-burner (the most convenient) or a window. The paper produces a diffused light over the whole apparatus, which renders the different parts, as seen through the telescope, very distinct. The two markers are made $\frac{1}{10}$in. deep, so that they throw a shadow on the meniscus of mercury, thus rendering it quite black. The illuminated silver paper forms the back ground and gives the greatest possible distinctness to it. A slight touch now moves the telescope in the same horizontal plane, so that the eudiometer comes into view. The two markers prpject beyond the pressure tube, and reach to about half way across the eudiometer, and the next operation is to bring the mercury meniscus in the eudiometer to such a height that it also exactly touches the lower edge of the marker. This raising or lowering of the mercury is effected by means of the fine adjustment before described attached to the upper clamp, which holds the eudiometer. The bringing of the mercury to the required height is as easy as in the former case; the only difference is that the marker, extending in this case only half way across the tube, leaves half of the meniscus illuminated, while the other half of the marker is quite dark, similar to the meniscus in the pressure tube. After adjusting the mercury in the eudiometer, so that the marker behind it is a tangent to the highest part of the meniscus, the telescope should again be turned to the pressure tube, in order to ascertain whether any appreciable alteration of the height of the mercury in it has taken place, by the raising or lowering of the eudiometer; and if so it is readjusted, which is but the work of a moment, the mercury in the eudiometer is again brought to the mark, and the height of the top of the meniscus read off on the graduated scale of the tube. Since the right hand half of the meniscus has no marker behind it, this is easily done, the diffused light behind rending the graduation on the eudiometer particularly distinct. If the light behind should be so strong as to render the illuminated half of the meniscus somewhat indistinct, it is brought out with great sharpness by holding between it and the paper screen any opaque body, so as to throw its shadow on the meniscus, but without cutting off the light immediately above the meniscus. It is most convenient if the figures are written on the right hand side of the scale etched on the tube.

In the former part of this paper, we have described the clamp which holds the rod carrying the pressure tube, and have dwelt on the necessity of this rod being quite straight. It will now be evident that it is necessary for the accuracy of this method of measuring a gas, that the pressure tube should move up or down, so that the two markers attached to it always remain in a horizontal direction. The clamp sliding on the pillar passing through the table is always screwed to it exactly at the same place as shown by a mark on the rod. Before using the apparatus, it must be ascertained that the two markers are perfectly horizontal, and that they maintain this position when the pressure tube is raised or lowered to its fullest extent. The best method of doing this is to place immediately behind one of the markers a small glass vessel, with flat sides, containing mercury; then, on raising or lowering the tube, or by altering the amount of mercury in the vessel, the surface of the mercury may be brought close up to the lower edge of the marker, and by comparing the two throughout their whole length, especially when the distance between them is very small, it is at once seen whether the marker is horizontal. The observation may be made with the telescope, the paper screen and lamp being used. If this test shows the markers not to be horizontal, they are brought into that position by altering the level of the table, which should be a three-legged one. This is done either by screws fixed to the legs, or simply by introducing very thin wedges under the legs.

It will be obvious that there are several advantages in having the lower part of the pressure tube smaller than the upper part, for it then requires a smaller well to move freely up and down in, and less mercury to fill both tube and well. Care must be taken that the pressure tube does not at any time touch the sides of this well; for if it did, that would, of course, throw the the markers out of their horizontal position. The tube, on being tapped, should always vibrate readily; this shows that it hangs free. Again, by diminishing the amount of mercury in the pressure tube as much as possible, we diminish the tendency it has to draw the iron pillar which supports it out of the vertical direction. When once properly adjusted, we do not find these markers liable to alter their position. All the readings are made with the gas saturated with moisture. A drop of water is introduced into the eudiometer before filling it with mercury, and enough of it always remains adhering to the tube to saturate the gas, and even if the eudiometer has, in the course of an analysis, been filled two or three times with mercury. A very small quantity of water, as before mentioned, is also introduced into the pressure tube to saturate the standard volume of air. Any alteration in the temperature of the water surrounding the tubes during an analyses will not, as before pointed out, affect the accuracy of the results, provided that both tubes have undergone the same change of temperature. Since they are surrounded by some quantity of water, this condition is easily ensured by thoroughly agitating the water from time to time. This may conveniently be done by means of a wooden stirrer, having the form of a hoe.

To give an idea of the accuracy of this method, we may cite a few consecutive analyses of air freed from carbonic acid:—

1st. Specimen of Air.

Air employed	202·83	Oxygen	21.002
After addition of hydrogen	363·84	Nitrogen	78·998
After explosion	286·04		
			100·000
Air employed	213 87	Oxygen	20·997
After addition of hydrogen	376·49	Nitrogen	79·003
After explosion	241·77		
			100·000
Air employed	252·42	Oxygen	20·991
After addition of hydrogen	419·58	Nitrogen	79·009
After explosion	260·62		
			100·000

2nd Specimen of Air.

Air employed	201·18	Air employed	211·10
After addition of hydrogen	353·34	After addition of hydrogen	375·27
After explosion	226·74	After explosion	242·59
Oxygen	20·976	Oxygen	20·966
Nitrogen	79.024	Nitrogen	79·034
	100·000		100·000

Air employed	194·88	Air employed	209·66
After addition of hydrogen	337·38	After addition of hydrogen	375·06
After explosion	214·83	After explosion	243·21
Oxygen	20·961	Oxygen	20·962
Nitrogen	70·039	Nitrogen	79·038
	100·000		100·000

It will be seen that in these analyses a comparatively small bulk of air was operated on, so that even a small absolute error would have led to a considerable alteration in the per centage composition of the air.

It now only remains for us to describe the method of applying the reagents. These are generally in a plastic form; for instance, if a gas to be subjected to the action of caustic potash, more or less of the inside of the laboratory vessel is covered with the reagent, by means of a wire brush. To obtain the potash of the proper degree of consistency, it is fused with a little water in a silver crucible. The small brush, made by binding a number of short pieces of thin iron wire together, is from time to time dipped into it, and the potash adhering to it spread on a piece of glass. The evaporation should be carried on till the trail-drop becomes solid on cooling, but still has a translucent appearance. The lamp is then immediately removed from under the crucible, and the potash is painted on the inside of the laboratory vessel round the middle, but not carried far up the conical part of it. Immediately after this operation is completed, the glass is placed in its position over the syphon tube, screwed down, and filled with mercury, the eudiometer having, of course, been previously raised out of the well and placed on one side where it is supported by its clamp. The application of the reagent in this way has several advantages over any other method that has been proposed. If any air should adhere to the surface of the potash, the means exist of entirely removing it. This is done simply by forming a vacuum in the laboratory vessel; the air immediately diffuses into it, and is expelled through the syphon tube by allowing the mercury to flow into it from the reservoir. After the gas has been in contact with the potash, a vacuum is again formed, and the adhering gas, if any, passed into the eudiometer.

The caustic potash, when painted on in the proper condition, absorbs carbonic acid very rapidly, the absorption of a large amount of carbonic acid being completed in five minutes. The special object of not painting the top of the laboratory vessel with potash, is that in case a little of it should become liquid and float on the mercury, this will attach itself to the glass and not be carried into the syphon tube. In case, by any accident, potash should be carried into the syphon tube, it is easy to draw a little water through it, which will, of course, immediately remove it.

The following are two analyses made of a mixture of air and carbonic acid:—

Volume of gas taken	248·02
After absorption by potash	201·80
After addition of hydrogen	356·80
After explosion	231·25
Carbonic acid	18·64
Oxygen	16·87
Nitrogen	64·49
	100·000

Volume of gas taken	230·63
After absorption by potash	187·56
After addition of hydrogen	331·11
After explosion	214·17
Carbonic acid	18·68
Oxygen	16·90
Nitrogen	64.42
	100·000

For the absorption of oxygen the simplest way of applying pyrogallate of potash, is to prepare the potash in the way before described, and then just before painting it on the laboratory vessel, some pyrogallic acid is added, and the mixture applied by means of the wire-brush.

The fuming sulphuric acid for the absorption of hydrocarbons is best applied by means of a coke ball. The gas passed over into the laboratory vessel, the bar which presses it down taken off, and the coke ball introduced in the ordinary way; the absorption of the hydrocarbons takes place very rapidly. A potash-ball is afterwards introduced to absorb the acid vapours As far as the form of this apparatus is concerned, it will be evident there is nothing to prevent the use of solid reagents in all cases if thought desirable.

The following are analyses of mixtures of known quantities of different gases:—

Volume of air employed	182·45
After addition of hydrogen	213·84
After addition of carbonic acid	257·98
After absorption by potash	213·84
After explosion	166·72

	Employed.	Found
Carbonic acid	17·11	17·11
Hydrogen	12·18	12·17
Air	70 72	70·72
	100·000	100·000

Volume of nitrogen employed	95·76
After addition of carbonic acid	112·14
After addition of oxygen	132·73
After absorption by potash	116·27
After addition of hydrogen	187·90
After explosion	125·88

	Employed.	Found.
Carbonic acid	12·34	12·40
Oxygen	15·51	15·52
Nitrogen	72·15	72·08
	100·000	100·000

In the last analyses, only a very small quantity of gas was employed, and all the readings, except the one after adding hydrogen, were made by using the lower mark on the pressure tube, and thus expanding the gas to about double its volume at atmospheric pressure.

Oxygen or hydrogen is introduced into the eudiometer in the same way as in the ordinary process; it is only necessary to use a longer delivery tube, the end of which is introduced within the glass cylinder, by dipping it down the narrow canal joining the two circular troughs.

The best way of introducing into the apparatus the gas to be annalysed, will depend upon the form of the vessel which contains it; if it should have a delivery tube, the gas can at once be bubbled up into the laboratory vessel, which has been previously filled with mercury; if it is contained in a tube, this is passed down over the syphon tube and the gas sucked out of it into the laboratory vessel. The tube containing the gas is easily brought over the syphon, either by removing the large glass cylinder, or by fastening a stick to the tube, which is done with a couple of caoutchouc rings, dipping the open end of it in a cup of mercury attached to a long rod and thus lowering it into the mercury trough. A third way is to bubble the gas at once into the eudiometer and then transfer it to the apparatus

MEASUREMENT OF GAS.

In the mechanical section Mr. Glover read an admirable paper on the measurement of gas. The following is an abstract:—When about fifty years ago coal-gas was introduced, the want of a measure for its sale was at once felt. This was clearly indispensable in the event of its becoming a stable article of merchandise. To meet this want, Mr. Samuel Clegg invented the instrument, which from the circumstance of of its measuring part being a drum revolving in water, has been denominated the wet gas meter. Ingenious in principle, it has been found to have defects in practice. Its chief defect arises from the evaporation of the water, causing constant variation in the measuring capacity of the meter. This variation is acknowledged, even at the present day, to reach as high as from 20 to 30 per cent. There has been no lack of effort to remove this defect. Ingenuity, labour, and vasts sums of money have been lavished upon it. Even could the level of the water be preserved at the same plane, the inclination of the meter would cause it to vary in measurement. And was the instrument so made that the sides of its measuring chambers should be at right angles to the plane of the water contained in it, this condition could only be preserved by making the bottom of the meter as perfect a plane as the water, and parallel with it, and the floor or shelf on which it is placed would require to be equally so, and to be mantained so. The measurement also varies according to the amount of pressure of the gas as it enters the meter, this pressure varying from 5-10ths of an inch water-pressure to six times that amount, according to circumstances. These causes of variation are constantly at work, and impart the instability of the water to the measure itself. It is attempted to retard the evaporation of the water by placing the meter in a cool situation; the consequence is, that some of the constituents of the gas are condensed; the water gets thick and tarry; the inner surface of the measuring chambers is coated with viscid substances; layer upon layer is deposited, and the size of the chambers is diminished. Wherever the meter is placed the variation is only a question of degree. Should its situation be warm, the evaporation goes on rapidly. To preserve an uniform measurement, Clegg, shortly before his death, invented a method of floating the drum. The simplicity and theoretical beauty of this invention is apparent, and could the revolving drum be kept perfectly balanced and free from deposit, the water from impurity, the pressure of the gas from variation, it might be hoped that one serious practical objection to the wet meter had been removed. Sudden and unexpected extinction of the light occur from the float falling in wet meters when there is too little water, and when there is too much, from the water passing over the lip of the spout and excluding the gas. From this cause lamentable disasters have occured in public assemblies, as in churches and theatres. And surely it is a most unjustifiable addition to the dangers of railway travelling, to expose the signal lights to such contingencies. The interest alike of the public and the gas companies require that the evil should be no longer evaded, but fairly met. The prevailing dissatisfaction, and the antagonism prejudicial to both which it necessarily created, at length drew the attention of the Legislature to the subject. The mere fact that gas is not a liquid or solid, but an aeriform body, does not make it less desirable that a purchaser should obtain the quantity he pays for, or that the seller should be paid for the quantity he delivers. If security be given for the just measurement of gallons of oil and pounds of candles, it is equally required for cubic feet of gas. The Astronomer Royal's familiarity with the subject of the Standard Weights and Measures, specially qualifying him for such a duty, and his services to the Exchequer in connection with this subject having been acknowledged as of high value, their lordships applied to him to assist in providing the instruments and apparatus required by the Act. Acting under the authority of the Lords Commissioners, and with the assistance of Professor Miller, of Cambridge, the Astronomer Royal provided a bottle for measuring the cubic foot defined in Section 2. The idea of a legal standard of measure necessarily involves the highest attainable accuracy. Nothing short of this will satisfy either the Legislature or the public. Any amount of error which can be averted is a self-inflicted evil. The subject of weights and measures, even for solids and liquids, is confessedly one of great practical difficulty. The records of the Royal Society abundantly testify how much time, labour, and thought have been given to the solution of those apparently simple questions.—What is a pound weight; what is a yard? But in constructing a legal standard measure for gas, the difficulties are necessarily much more complicated. An aeriform body has to be measured; invisible, highly elastic, varying in volume with every barometric change, very complex in its constitution, affected by every change of temperature, liable to condensation, and to be absorbed by water, of which it is also an absorbent. In constructing a standard measure, these various properties require to be taken into account, and the following con-

ditions were considered essential: that the metal for making the bell should be such as would resist the chemical action of the constituents of coal gas and water, that this anti-corrosive substance should readily part with water, and be sufficiently hard to resist change of form, the application of any ordinary forces, that the bell should be a truly cylindrical vessel, having a correct seal engraved upon it, at once legible and durable, to indicate its capacity in cubic feet, and the decimal part of each foot; and that by strict attention to the mechanical adaptation of all the parts of the instrument, and the selection of materials and forms best adapted to their purpose, it should, as a whole, work easily, steadily, and correctly. The graduation of the holders involves nice scientific considerations, and a series of experiments requiring great delicacy and care. The cubic foot bottle, though accurately adjusted for containing the legal standard or unit of measure, yet there was no method known by which it could be used directly in the graduation of gas holders, or the division into multiples and decimals of a cubic foot. The instrumeat called a transferrer was resorted to, consisting of an upper chamber containing exactly the volume of one cubic foot, and adapted with proper arrangements of cocks and pipes, by repeated discharges of the water, filling the upper chamber, into the lower chamber, to discharge in succession any number of volumes of air, each of one cubic foot, into any vessel properly prepared for their reception. With this instrument, trial upon trial was made, but with no satisfactory result. It was open to serious objections. The filling of the bottle produced agitation of the water, displacing air from the water, and entangling variable quantities of air in minute bubbles, many of which adhered to the inner surface of the bottle. Every means which suggested itself was tried to make it available, but these failing to give a uniform result, it was laid aside. Analogous methods of transferring the exact cubic foot of air to the gas holders were resorted to, by which some of the objections to the transferrer were obviated, and a closer approximation made to uniformity of result. Still this uniformity was not such as to justify their adoption in the division of the scale. Eventually a plan was adopted which was found free from the same liability to error. Instead of using the cubic foot bottle indirectly through the intervention of a second vessel, as had hitherto been done, the second vessel was dispensed with, and the bottle was used directly. Close the opening caused by the withdrawal of the plug with glass; solder a piece of leaden tube to the end of the tap, connect this tube with the gasholder to be tested; place a cistern below the bottle which has been secured in a fixed position; raise the cistern steadily, without agitation of the water, through the entire length of the bottle until the water reaches the point where the plug of the tap, had it been retained, would have stopped it, the entire volume of air, viz., one cubic foot defined by the contents of the bottle will be found to have been transferred to the gasholder. Tested by numerous experiments the result of this method have been invariably satisfactory, and it has removed a difficulty long felt by meter makers in the graduation of their holders for testing meters. To reduce to practice the idea of a machine for the accurate measurement and correct registration of gas, the experience of half a century has shown to be no easy problem. The construction of a good and durable dry gas meter involves a multiplicity of mechanical and chemical considerations, to each of which its due weight must be assigned. A subtle, invisible, elastic and complex fluid, susceptible of change in condition and volume from very slight variations of temperature and pressure, has to be accurately measured, and the result must be correctly recorded. The instrument is self-acting. It must do its work in a closed chamber, continuously or at intervals, and free from all interference. The parts of the instrument which come in contact with gas must be made of anti corrosive material. And the material forms and combinations of its different parts must be so accurately adopted as to produce steadiness, uniformity and correctness in its movements. Whilst gas, having become a staple commodity, one of the necessaries of life, that it may have a real practical value, the instrument for its measurement must be produced at a price which will place it within the reach of every class. Realizing these essential conditions, and approaching as near as may be to the accuracy of the standards, the dry gas meter has taken the place to which it is entitled, as a valuable addition to many ingenious and useful contrivances of mechanical science.—*London Ironmonger.*

THE NEW LIGHT.

One of the most attractive, if not the most scientific, features of the British Association meeting was the lecture on Light, by Prof. Roscoe, in the course of which he exhibited the magnesium light. The light emitted by burning magnesium wire is exceedingly rich in chemical rays, so much so that it may be used instead of sunlight for the purposes of photography. As an illustration, a photograph of Sir Charles Lyell was taken and shown upon the screen. The spectrum of burning magnesium is exceedingly rich in violet and ultra-violet rays, partly due to the intensely heated magnesia formed by the combustion. The chemically active power of the magnesium light was determined some five years since, and its use for photographic purposes proposed. It was shown that a burning surface of magnesium wire, which, seen from a point at the sea level, has an apparent magnitude equal to that of the sun, effects on that point the same amount of chemical action as the sun would do if shining from a cloudless sky at 90° 53' above the horizon. On comparing the visible brightness of these two sources of light, it was found that the brightness of the sun's disc, as measured by the eye, is 524 times as great as that of burning magnesium when the sun's zenith distance is 67° 22', whilst at the same zenith distance the sun's chemical brightness is only five times as great—Hence the value of this light as a source of the chemically active rays for photographic purposes becomes at once apparent. In the memoirs published in the above year, it is stated that the steady and equable light evolved by magnesium wire burning in the air, and the immense chemical action thus produced, render this source of light valuable as a simple means of obtaining a given quantity of chemical illumination, and that the combustion of this metal constitutes so definite and simple a source of light for the purposes of photo-chemical measurement, that the wide distribution of magnesium becomes desirable. The application of this metal as a source of light may become even of technical importance. A burning magnesium wire of the thickness of 0·297 millimetre evolves as much light as 74 stearine candles, of which five go to the pound. If this light lasted one minute, "0·987 metre of wire, weighing 0·120 grammes, would be burnt. In order to produce a light equal to 74 stearine candles burning for 10 hours, whereby about 20 lbs. of stearine is consumed, 72·2 grammes (2 1-2 ozs.) of magnesium would be required. The magnesium wire can be easily prepared by forcing out the metal from a heated steel press, having a fine opening at bottom; this wire might be rolled up in coils upon a spindle, which could be made to revolve by clock-work, and thus the end of the wire, guided by passing through a groove or between rollers, could be continually pushed forward into a gas or spirit lamp flame, in which it would burn. The manufacture of this metal is now carried on under Mr. Sonstadt's patent, by the Magnesium Metal Company of Manchester, and the light evolved by the burning wire is likely to be applied to very many technical purposes. It appears that the Manchester company has received an application from the managers of the gas-works at Rio de Janeiro, who seem to think it would be better for them there to light with magnesium wire than with gas; Prof. Roscoe believed it was a serious proposal, but scarcely expected such an idea would be carried out in practice.

THE WATER SUPPLY OF LONDON.

A London weekly paper says: "Three of the great water companies extend their suction pipes of supply—their chyle ducts, to follow out our anatomical similitude—as far as Hampton. Miles and miles into the country we may see great mains a yard in diameter, dipping under the Thames, crossing deep ditches, and passing along the fields and furzy commons, at certain points intercommunicating with each other, in case either may require temporary help. The far off source is little dreamt of by the thirsty soul, who quaffs from the drinking-fountain in the crowded street. He little fancies that, like the lounger he watches at Verey's, sucking his sherry cobbler along a straw, he, too, is sucking at the stream through ten miles of iron pipe, the end of which dips into the Thames close to Wolsey's pleasant palace. The great mains of all the companies are thirty-six inches in diameter, and it must be remembered they are free and fully charged at all times so that, in case of fire, the fireman has only to turn the plug to get any quantity of water he requires. In some cases, such as at the great fire in Tooley street thousands of tons of water are thus abstracted gratuitously without interfering with the supply to the houses.

"At the beginning of the present century the mains indeed all the pipes, were wooden—the trunks of trees bored out—and in no case of more than one foot in diameter. How the metropolitan giant must have grown the size of his present iron arteries is a proof. The mains of the eight water companies not only supply London proper, but push out far into the country, invading even the agricultural districts, and supplying its farms. They distribute in the aggregate upwards of 100,000,000 of gallons daily. through 3,000 and odd miles of main, and supply 375,000 houses and factories, through capillary pipes upwards of 7,000 miles in length. If all the water daily used in this great city were collected in one great reservoir, it would cover seventy acres in extent and six feet in depth. As the spectator watched this great expanse of water, he would see it hour by hour drained to the bottom by the collective millions in the metropolis as calmly and noiselessly as a cup is drained by a dusty roadside traveller. The collective iron heart, the steam engines which propel this flood, possesses a force of not less than 9,000 horses."

More Salt Discoveries.—A Mr. Bourne, of Austin, Nevada, while on a recent exploring expedition in that Territory, at a place about 75 miles south of a mining camp known as San Antonio, and about the same distance from Walker's Lake, discovered the largest deposit of native salt found on this side the American Continent. It consists of a plain of ten miles square covered with salt, from six inches to three feet in depth. This salt plain is continuous, and is without shrub or sandhill, extending white and glistening as far as the eye can reach. One of the curiosities of this plain is that in the midst of it is a large boiling spring, of exceedingly salt water, and rising from a bed of salt apparently of its own deposit. The spring appears to have been much larger than at present, but its own deposits have so encroached upon it that it has built up a mound of that material, and reduced its aperture to about four feet in diameter. Good fresh water is found in the hills bordering the plain.

A rich gold claim has been lately discovered near the town of Camp Seco, in an old abandoned hill called Ragtown Hill. The gravel is some six feet deep, paying all the way through. The hill is all claimed, and many miners are busily engaged in opening their claims. The prospect thus far is most flattering, as the hill is quite extensive.

THE MINING & PETROLEUM STANDARD AND AMERICAN GAS-LIGHT JOURNAL, is published at No. 15 Nassau street, cor. Pine, on the 2d and 16th of every month, and is a recognized official organ of—

LIGHT, HEAT, MINING INTERESTS.

PETROLEUM, WATER-SUPPLY, AND

SCIENTIFIC SUBJECTS GENERALLY.

JAMES W. BRYANT, EDITOR AND PROPRIETOR.

W. S. SHERMAN, PUBLISHER.

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AGENTS.

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AND

AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 2D AND 16TH OF EVERY MONTH.

JAMES W. BRYANT, ... EDITOR.

WEDNESDAY, NOV. 16, 1864.

BACK NUMBERS WANTED.—We want to complete our files of the Journal, the following numbers, for which we are willing to pay full price.

Vol. II—No.'s 13, 22, 24, 25, 29 and 34.

Vol. III—No.'s 40, 42, 44, 47, 48, 52 and 56.

Vol. IV—No.'s 63, 64, 67, 68, 69, 70, 72, 74, 80, 82, 83.

Vol. V.—No.'s 91, 93, 95 and 96.

Those of our subscribers who do not bind the Journal, would do us an especial favor by forwarding to us any of the above numbers. We are being constantly called upon to furnish back issues of our paper by those who value it for future reference, and we have supplied them until all of the above numbers are exhausted.

☞ We are at present without our usual valuable scientific contributions from Prof. Henry Wurtz, in consequence of his absence in Canada, where he is occupied in some important geological and mining examinations. His attention to the New Hampshire Silver Lead Mines which have opened so favorably, has also kept him from devoting his pen to us—he will, however, soon gratify our readers with some articles.

OIL OR GAS WELLS IN CHINA.—In the districts of Young Hian and of Meisonug-Hian, in China, there exists a large number of salt water wells extending over a space of about six leagues, which are actively explored by the neighboring population. From the mouth of these wells arise columns of inflammable air; so that if a torch be applied to the opening, globes of fire of from twenty to thirty feet high are seen to arise, shining with a brilliant light. The Chinese arch over these sources of gas with long bamboo tubes, and the gas communicated through those tubes serves to illuminate the machines by which the salt wells and the places where they are situated are explored. It thus appears that gas, so much admired in Europe and America, was known to the Chinese centuries ago.

HOW IS COAL OIL, OR PETROLEUM, PRODUCED OR FORMED?

This question is not easily answered. Distinguished geologists have not been able to determine. Some have thought it was the result of chemical action upon vegetable matter in the rocks; others, upon animal matters, and others, that the action might involve both. As it is found in association with coal fields, the first has been the prevalent opinion. But no one has considered the question as satisfactorily answered.

Your paper has published from the Pittsburgh Chronicle, an answer to the question, of the most *positive* character. As the chemical action is detailed, it is easy to see the absurdity and expose the *scientific* mistake. Thus the writer in the Pittsburgh Chronicle, says: "Petroleum is known to be a hydro-carbon,"—which is true—"composed of two gases,"—which is false. A hydro-carbon is composed of hydrogen (a gas) and carbon, (a solid, and not a gas). There are abundant elements in nature, more than adequate to supply all the petroleum for ages. But he adds, "hydrogen is constituted of water," that is, this "primary element," as he calls it with truth, is also a compound and not an element: he should have said, hydrogen is a component of water, or, water is a component of hydrogen and oxygen, too long and too well known for such a mistake. Water then is the source of the hydrogen in the petroleum.

The Chronicle then gives limestone as the source of the carbon needed. Limestone is composed of lime and carbonic acid (not carbon), but there is carbon in full supply. Now, for their union in the rocks to produce petroleum, the writer says, that "limestone of unknown thickness" underlies the "Oil Rock," and that porous sand-stone overlies the Oil Rock;" that "water falling on the surface and percolating through the porous sand-stone, finally reaches the limestone rock, and decomposes it, the carbon in the rock and the hydrogen of the water uniting to form the petroleum, while the oxygen is set free." Of course the oxygen of the carbonic acid must be set free also. This is very fine; the only difficulty being that no such decomposition is known to occur, and that the chemist has never been able by means of water to decompose limestone, or to believe that such decomposition is possible. The question is still unanswered. C. D.

OFFICERS OF THE PETROLEUM STOCK EXCHANGE OF NEW YORK.—President, Samuel B. Hard; Vice-President, Alve E. Laing; Treasurer, Henry Holthausen; Secretary, Edmund C. Stedman; Assistant Secretary, Isaac B. Newcomb; Executive Committee, Samuel Hicks, Wed. W. Clarke; Finance Committee, Charles H. Pierce, Richard W. King; Membership Committee, William B. Rice, R. Kingsland, F. A. Van Dyke, Jr., E. S. Saxton, Wed. W. Clarke; Chairman Arbitration Committee, Thomas C. T. Buckley. The following rates of commission were established for purchases and sale of oil stocks: On all stocks bought or sold at $5 per share, or under, a commission of five cents per share: on all over $5 per share, a commission of ten cents per share. The board started with a large reserve fund, to insure its standing and permanency, and has rented the room on the first story of the building occupied by the Open Board of Brokers in Broad st.

In 1860 petroleum oil was unknown in France; in 1861 forty casks were sent there as a curiosity; in 1862 3,994 casks were sent there as an experiment; in 1863 the demand there brought 29,197 casks; and this year, so far, 56,672 casks have been sent to Marseilles.

LEAD-SMELTING BY RACHETTE'S FURNACE

The general interest felt in Rachette's furnace has caused great attention to be attracted to an attempt now being made at the Altenauer silver works, in the Upper Harz, to apply it to the smelting of lead. This furnace was commenced working on Tuesday, June 28; it being first filled with charcoal. At 10 o'clock in the morning the furnace was charged with slag over each tuyere and then with ore and coke. The blast was let on at 5 o'clock in the afternoon, first with a pressure of 6‴ of quicksilver, which was afterward increased to 9‴ or 10‴. Up to Saturday morning, July 2, the furnace had yielded 210 centners (10½ tuns) of pig lead, and 191 centners (9½ tuns) of lead regulus, from charges made up in the proportion of 10 of ore and flux to 1 of coke: while during the same period an ordinary furnace only yielded 83 centners (4 tuns 3 cwt.) of pig lead, and 77 centners (3 tuns 17 cwt.) of regulus, from charges in the proportion of 7 of ore and flux to 1 of coke. No difficulty was experienced in keeping the throat from flaming, and it smoked but little. The formation and separation of the furnace products went on satisfactorily, and the furnace was tapped at regular intervals, at both ends. The only fault to be found with the working was due to the sandstone below the tuyeres shelling off causing the latter to become red-hot underneath—a fault which was remedied partly by throwing water over them to keep them cool, and partly by timely replacing them by new ones. Up to July 8, the furnace worked very well, yielding three times the produce of an ordinary furnace; but after that date, some of the tuyeres became much clogged, and consequently the yield decreased, although it was hoped that this might be remedied by adding a suitable quality of slag to the charge. The yield of the furnace never, however, fell below twice that of an ordinary furnace; and when the unreduced charge and unburnt coke which had got down into the hearth in consequence of the clogging of the tuyeres, had been removed by partially opening the breast of the furnace, the latter again worked satisfactorily. The slag produced was not richer, and sometimes even poorer, than slags from the ordinary furnace; and the tuyeres appeared perfectly bright.

On August 1, the yield was still twice as great as that of the ordinary furnaces, and the slags were much poorer in lead. The throat remained dark, and without giving off any large quantity of smoke; but the tuyeres required to be frequently renewed.—*London Mining and Smelting Magazine.*

ALUMINIUM.—It is announced that M. Corbelli has discovered a method of extracting aluminium from clay, more simple and economical than any of the processes hitherto employed. "The metal is obtained directly from clay or argillaceous earth, deprived of stones, leaves, and all other foreign bodies. 100 parts of this clay is dried, and then submitted to the action of an acid for the extraction of any iron it may contain. For this purpose the clay may be dissolved in six times its weight of concentrated sulphuric acid, nitric acid, or hydrochloric acid. After the dissolution of the clay in the acid and the deposition of the earthy matters, the liquid is poured off. The residuum is again dried, then heated to 450° to 500° centigrade, and afterwards mixed with 200 grammes of prussiate of potash, the quantity being increased or diminished according to the proportion of silica contained in the clay. The mixture is put into a crucible and heated to whiteness. After cooling, the aluminium will be found at the bottom of the crucible."

The petroleum produced in the State of Pennsylvania was sold at the wells for $56,000,000 during the last twelve months, and the iron and coal of Pennsylvania only produced $51,000,000. In Philadelphia, the daily sales of petroleum stocks at the regular stock exchange board are over $200,000.—The number of petroleum companies organized is about 150, and in New York about 80.

HARD ON THE HOGS.

One of the most common causes of blood impurities is the use of pork. It has been said that all things were created for some wise purpose; but hogs were never made to eat. Christ only used them to drown the devils; they can never be of any other beneficent use. As an article of diet, pork exerts a most pernicious influence on the blood, overloading it with carbonic gas, and filling it with scrofula. The hog is not a healthy animal. From its birth it is an inveterate gormandizer—and to satisfy its eternal cravings for food, everything in field or gutter, however filthy, finds a lodgment in its capacious stomach. It eats filth, wallows in filth, and is itself but a living mass of filth. Our bodies are made up of the things that have been picked up from our plates. The humoral properties and inflammatory effect which pork imparts to the blood, tend to germinate vermin in the system. Grub in the liver, kidneys, lungs, and other organs frequently have their origin in the use of this filthy article of food The Gazette Medicale asserts that "the tape-worm troubles only those who eat pork." It further remarks that the Hebrews are never troubled with it, but the pork butchers are peculiarly liable to it, and that dogs fed upon it are universally so afflicted. In fact, it turns out that a small parasite worm, called "Crysticerons, which much affects pork, no sooner reaches the human' stomach, than, from the change of diet and position, it is changed into the well-known tape-worm: and the experiments of M. Kuchenmeister, of Zittoria, made with great professional care upon an executed criminal have established the fact beyond doubt.—*Medical Common Sense.*

GAS IN EGYPT.—On the 23d of September the city of Alexandria was lighted for the first time by gas, the works having been erected by a French company. The lamplighter is nightly followed in his rounds by a crowd of wondering Arabs, who insist that the marvelous blaze following the touch of his torch must be provoked by the will of a genie, or "djinn," as Mr. Lane would have us spell the familiar word of the Arabian Nights. This improvement causes a great change in the habits of the place. Heretofore a municipal regulation has required everybody going abroad after nightfall to carry his own lantern, but this is no longer necessary.

The Confidence Mining Company, of Gold Hill, has declared a dividend of $100 a foot.

NATURAL VENTILATION INTERPRETED AND PRACTICALLY APPLIED.—A concise little paper upon this subject has just been issued by Mr Thos Foyle. The writer proposes that the ventilation shall be conducted by introducing the cold air at the floor, and penmitting it to escape near the upper part of the chamber, instead of the more natural system of admitting the coal air near the ceiling, and letting it percolate throngh the lighter warm air, which it is desired to remove. Of course, Mr. Boyle's system is well calculated to display the skill of the fitter in a manner which the natural system would leave no room for. The theory of Mr, Boyle's proposition is readily understood—the cold air entering at the bottom, and a free outlet for the warm being provided at the top of the chamber, the change of air is effected more rapidly than when the cold air has to past throngh the warm, but against this there is the fact that the draught which is inevitable when the cold curren is introduced at the floor is entirely avoided when it is introduced at the top.

M. Gossin, a distinguished agriculturist, of England recommends the admixture of willow leaves to all kind of fodder. Osier peelings may also be added with advantage. The admixture of the leaves and peelings above mentioned, will be particularly useful in preventing the rot, a disease so prevalent among sheep in winter, from making its appearauce.

PETROLEUM REVIEW—NOVEMBER 2d, 1864.

NEW YORK, NOV. 15, 1864.

CRUDE. The market has been firm, and until the fall in gold had an upward tendency—I notice sales of 1000 bls. on the spot at 45 cts. 40° to 47° gravity, 500 bls. t 45 cts. 40° to 45° gravity. 2,000 bls. b. c. all the month 46 cts. Before the fall in gold Crude 40° 47° gravity was ready sale at 46 to 47 cts.

REFINED. In bond has also been effected by the fall of Gold and Exchange—at the close it is selling at 68 to 71 cts. according to quality. During the early part of the week there was quite a brisk demand—and bonded was firm at 70 to 72 cts.—There have been no sales of bonded for the past two days, but holders are firm at 68 to 71 cts. as above.—Free has been active and very scarce, and has been effected less by the fall in gold than either Crude or Bonded, I notice sales at 87 to 89 cts. according to quality.

BENZOLE. Bonded 60° to 63° gravity—deo'd, 30 to 32 cts. and Free 60° to 65° gravity deo'd, 45 to 47 cts.

BONDED OIL. In cans and cases 85 cts—Free ditto $1,05 per gal.

REMARKS. The market is remarkable buoyant for this season of the year, and very firm. Our stock of oil is not large, and both Free and Crude are considerably over sold.

The arrivals are for the past two weeks 17.201 bls. and the exports for same time, 503.540 gal. and since January 1st, 19,872,052,

B. L. HARSELL.

Commission Merchant,

132 and 134 Maiden Lane, N. Y.

NEW YORK MINING EXCHANGE.

NEW YORK, NOV. 15 1864.

	Bid.	Asked		Bid.	Asked
Copper Stocks.			***Gold Stocks.***		
Aztec	7⅛	9	Benton	1	1⅛
Bedford	1	1⅛	Consol'd Gregory	25	28⅞
Boston	4⅛	5¾	Corydon	—	8
Caledonia, A. P.	10	12	Gunnel	3⅜	4⅛
Canada	3¼	4	Great Western	—	8
Carp Lake	3	5	Hope	—	9
Central	65	70	Isaac's Harbor	¾	⅞
Columbian	—	24	Manhattan	—	9
Copper Falls	34½	38	Mariposa	44	44¾
Clifton	—	81	Montana	⅜	1
Dacotah	—	5½	New York	2⅜	3
Derby	⅞	1⅛	N. Y. & Nova Scotia	⅝	1¼
Douglass	—	—	Quartz Hill	9¼	10
Evergreen	18¾	20	Quicksilver M'g Co	81	82
Flint Steel River	12	13⅛	Rocky Mountain	—	10⅛
Frue	2¾	5	Smith & Parmelee	7	12
Grand Portage	—	—			
Hancock	12¾	14	***Coal Stocks.***		
Hamilton	—	6	American	98	100
Hilton	5	6	Ashburton	—	25
Hudson	1	2	Central	62	65
Huron	32	33	Cumberland	61	62
Indiana	8¾	9¼	Del. & Hud. Canal	206	208
Isle Royale	20	20⅝	*Hampshire & Balt.	104	110
Keweenaw	—	6	Pennsylvania	213	215
Knowlton	7	10			
Lafayette	1	2	***Lead Stocks.***		
Manhattan	—	—	Bucks County	⅝	⅞
Mendota	—	—	Clute	1⅛	1⅜
Merrimac	4¾	5⅛	Erie	—	20
Minnesota	33	37	Macomb	3¾	5
New York, A. P.	2	3⅝	Plancentia Bay	1¾	1⅞
N. J. Consolidated	4	4¾	Sussex	¾	⅞
Norwich	—	6	Waltkill	3½	6
Ogima	5	6¾			
Ontonagon	3	4⅛	***Iron Stocks.***		
Penn	—	11½	Copake	8	10
Providence	1¾	2	French Creek	⅜	1
Quincy	96½	98	Teal Lake	4½	6
Reliance	1¾	2¾			
Rockland	12½	14	***Miscellaneous.***		
Superior	8⅝	9	Rutland Marble	17	20
Sharon Consolidated	—	3	* *Ex. div.*		

TO ADVERTISERS.—Our paper offers a superior medium as an advertising agent, to all those who manufacture or sell machinery or appliances of any kind for Gas, Mining, Water, Sewerage, the production or purification of Oils, &c. &c., not so much on account of a wide-spread circulation, as from the fact that it goes directly to the hands of those who are constantly using and requiring machines and improvements for these branches, and who look through our columns for information where to procure them. The class of people who read our paper not only peruse our pages of reading matter, but read the advertisements as well, for the reason that they are directly interested in all things pertaining to their business. We therefore ask, with confidence that we can do them justice, all parties having machinery or improvements of any kind for either of the objects to which our paper is devoted, to send in their advertisements and avail themselves of these advantages. It will be observed that our terms for advertisers are very reasonable.

TO OIL COMPANIES.

An experienced Railroad Contractor desires a situation as Superintendent of an Oil Company. Has no family, and is willing to go to any section of the country, and can furnish the best references. Address,

FALKNER McMURTRIE,
1015 Vine street, Philadelphia.

ATLAS
OF THE
OIL REGIONS.

The extraordinary developments of the last few years have rendered indispensable to the community, A NEW and RELIABLE map of that portion of Pennsylvania, known as the OIL REGIONS. And such a Map, in the form of an Atlas, made from actual surveys of the whole territory (and the only surveys that have been made in the territory,) is now being prepared for publication by the undersigned, to which your special attention is invited. In will embrace the whole of VENANGO and portions of CRAWFORD and WARREN Counties, and is designed to be the most complete and perfect work of the kind ever published, showing distinctly—

1 A general map of Venango and parts of Warren and Crawford counties, Penn., and enlarged plans of each township.

2 All the original lot lines.

3 All subsequent subdivisions of lots in the oil districts, with the names of present owners or lessees.

4 All the Roads, Rivers and Creeks accurately delineated.

5 All Dwellings, Factories, Mills, Refineries, and Shops of every description.

6 Enlarged plans of all important Towns and Villages.

7 Enlarged plans of all the oil lands on Aleghany River, Oil Creek, French, Pithole, Tionesta, Hemlock and Tidelute Creeks, Cherry and Cherry Tree Runs, and all other Creeks and Runs on which discoveries of oil have been made.

8 Location and brief description of the property of all the principal Oil Companies.

9 Location and names of all the Oil Wells in the Territory.

10 A brief history of the Oil Business, from its first discovery to the present time, with valuable statistical information, making a volume of some fifty pages, about 15x18 inches, substantially bound.

A limited number of business cards pertaining to the production or sale of oil, or oil territory, will be received, and if early application be made, parties may have views of their establishments, or wells, with brief notices of the same, inserted.

The surveys for the Atlas are completed, and the proprietors intend to have it ready for delivery to subscribers (only) by about the 1st of January next.

All persons or firms desiring the work are requested to send their names as subscribers to the undersigned before the 1st of December, and designate the number of copies wanted, and the place where they wish them delivered.

F. W. BEERS & CO.,
43 John St., New York,
or Franklin, Penn.

Franklin, Penn, Oct. 20, 1864.

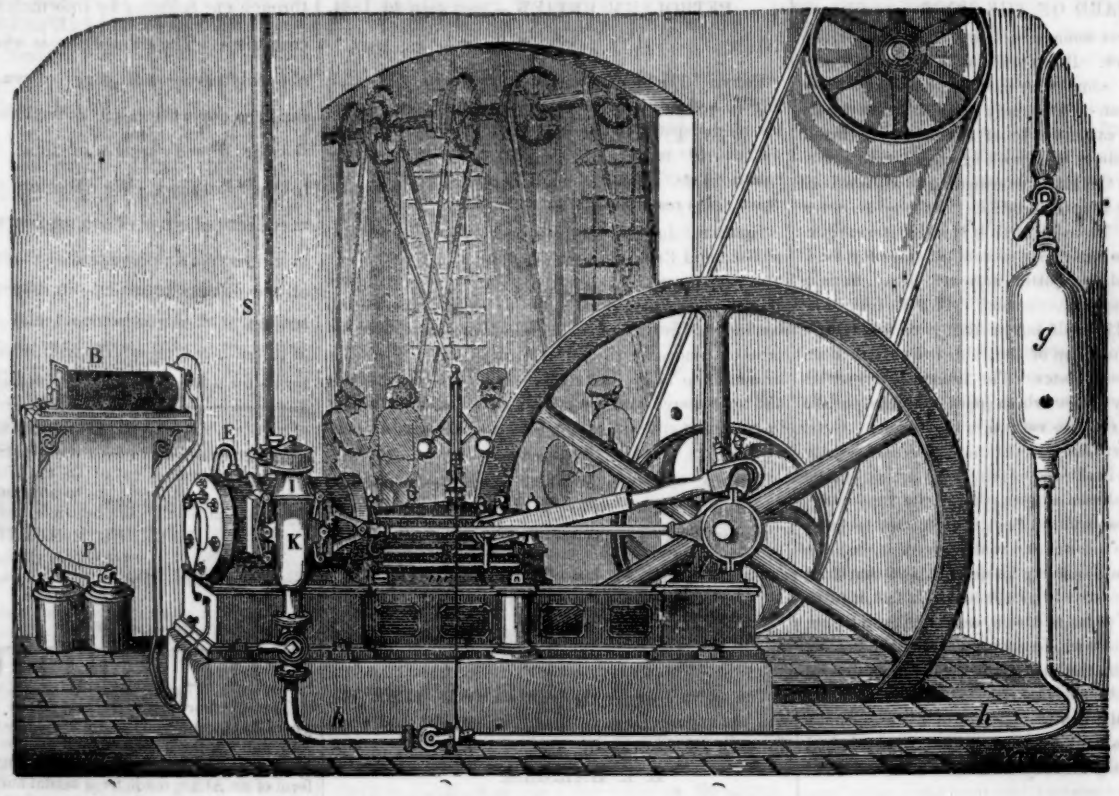
U. S. MAIL LINE FOR CALIFORNIA,
via Panama, under convoy of a United States war steamer throughout the Atlantic voyage.

The following first class side wheel steamers will be despatched at noon precisely, from pier No 3 North river.—

Nov. 3—NORTH STAR, Jones.
Nov. 14—COSTA RICA. Tinklepaugh.
Nov. 23—OCEAN QUEEN, Seabury.

For freight or passage apply to

D. B. ALLEN, No. 5 Bowling Green.



MOTEUR—LENOIR.

LENOIR GAS ENGINE.

This is a horizontal engine, in which a piston, by a connecting rod drives a horizontal shaft.

The gas enters by the pipe "h" from the regulating reservoir "g," (made of vulcanized india rubber,) which regulates the feeding and the branches connected with the gas-pipe.

The tube, K, receives the gas conveyed by the pipe "h," and conducts it to the valve, which opens and closes alternately, by means of a rod moved by an eccentric wheel fastened to the end of the shaft.

Two of Bunsen's piles, P, sufficient to produce the electricity are placed at a little distance from, and in communication with a Ruhmkorff electric apparatus, B. The electric current of this apparatus is conducted by means of insulated wires to the electricity distributor "m," placed on the front of the frame, while the current of electricity and its arrival at the inflammator, inserted at each end of the cylinder, is directed by the movement of the piston-rod, which, by an ingenious combination, impels a small movable slide before the distributor.

The burnt gas, after having performed its functions in the machine, escapes, by means of a valve, through a pipe, S, and the water designed to cool the interior of the cylinder enters through a double passage, by means of a pipe situated near the escape-valve, and goes out by the pipe, E.

A two horse and a half horse Engine are now in practical operation at the brass cock manufactory of Mr. A. Carr, *No.* 135 *Mercer St, between Prince and Houston Streets,* New York where those interested are invited to call and examine them.

THE LENOIR GAS ENGINE

Requires no Fire and makes no Smoke,

No Noise, no Dirt, and is thoroughly safe.

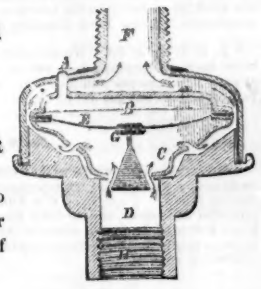
It is propelled by the expansion of Air, dilated by the combustion of Gas within the cylinder, ignited by the

ELECTRIC SPARK.

NOTICE TO GAS COMPANIES AND GAS CONSUMERS.

THOMPSON'S PATENT GAS CONTROLLER,

The only Self-Acting Gas Controller, Regulator, and Burner Combined which has ever been invented, or known to sci nce.



THE PRINCIPLE UPON WHICH THE THOMPSON'S AUTOMATIC GAS CONTROLLER works is one well known to mechanics, and is simple in its operation.

Within the circumference of a small cylinder below the burner is placed a conical valve attached to a movable diaphragm. The diaphragm rises or falls as the pressure of gas from the pipe is lesser or greater, and the valve acts upon the valve-seat with such regularity of movement that in a difference of from five-tenths of an inch pressure to five inches the variation in flame is hardly perceptible.

The simplicity of its machinery and the nature of the material used in its construction insure its regular action and durability.

In consequence of the uniform quantity of gas which passes the Controller to the burner, there is no waste, and a steady, soft flame is produced, which is important to all who read, write, or work by gas-light. The unsteady flickering blaze which invariably exists when the pressure of gas is beyond the requisition for consumption, has injured the sight of thousands who have been subjected to it.

For street lamps these Controllers are especially valuable, because the pressure varies materially during the night, and in consequence there is a waste of gas, and the light variable.

Improvements have lately been made in the mechanism of the Controller which makes them almost a perfect meter to each burner, and they are now offered to the public with more confidence than ever before.

Reference is permitted to the following named gentlemen—

Col. CHAS. ROOME, President Manhattan Gas Company, N. Y.
C. H. SANDS, Esq., President Metropolitan Gas Company, "
J. H. ADAM, Esq., President New York Gas Company, "
PETER COOPER, Esq., Cooper Institute, "
JOHN A. DUFF, Esq., Olympic Theatre, "
GEO. H. KITCHEN, Inspector of Gas Meters, N. Y.
A. L. BOGART, Esq., Gas Engineer.
Col. J. A. SABATTON, Engineer Manhattan Gas Company.
Col. A. J. WHITE, Engineer Metropolitan Gas Company.
J. K. SIMPSON, Esq., Engineer Cooper Institute.

Persons interested are invited to call at the manufactory, 52 Greene street, where they can see the operation by pressure guage and test meters.

M. L. CALLENDAR, Agent
Office, 52 GREENE STREET.

THE AMERICAN METER CO.,

Organized under the General Manufacturing Laws of the State of New York.

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER.

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

512 WEST TWENTY-SECOND STREET, NEW YORK,
ARCH AND TWENTY-SECOND STREETS, PHILADELPHIA,
1 BARRETT STREET, BOSTON, will meet with prompt attention.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

Patent GATES, for Water and Steam-stops.

HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
179 BROADWAY, N. Y.

GEO. H. KITCHEN & CO.,
NEW PATENT
GAS APPARATUS
For Country Residences, Public Buildings, &c.,
FROM $300 UPWARDS.
EVERY DESCRIPTION OF GAS FIXTURES.
Gas Fitting in all its branches.
561 Broadway,
NEW YORK.

NEW YORK FIRE-BRICK and Clay Retort Works. (Branch Works at Kreischerville, Staten Island.)

B. KREISCHER, office 56 Goerck street, corner Delancy street, New York.

GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND. Articles of every description made to order at the shortest notice. B. KREISCHER.

PHILADELPHIA FIRE-BRICK Works, corner of Vine and Twenty third streets, Philadelphia.

JOHN NEWKUMET,

Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice

GLYCERIN
FOR
Filling Wet Gas-Meters,
Cheaper than Whisky or any other substance.

We have furnished the Cincinnati Gas and Coke Company 300 barrels Glycerin, for filling their wet meters, and are now ready to supply other Gas Companies at the lowest cash prices.

We warrant our Glycerin not to corrode the meter metal, nor to freeze at the lowest ordinary temperature, nor to evaporate.

HARTMAN & LAIST,
Manufacturing Chemists,
Cincinnati, O.
Office 64 Sycamore.
Agent in New York, Paul Balluff, 95 Maiden Lane

WOODEN PURIFYING TRAYS.

PATENT
Conically Slotted Solid Wood Sieves
FOR GAS PURIFIERS.
CAUTION
TO
GAS MANUFACTURERS.

The Conically Slotted Solid Wood Tray was patented 21st October, 1862, by N. O. Hawxhurst, assignee of Wm. Combe, and all persons are cautioned against purchasing such trays of R. G. Hunt, or any other person except the subscriber, as it is a direct infringment of said patent. The following companies are now using these trays.

Manhattan, New York,
Williamsburgh,
Brooklyn,
Albany,
Baltimore,
Philadelphia,
Chicago,
Louisville,
And numerous others.

Orders received by mail or otherwise

JOHN L. CHEESMAN,
347 Ave. C, New York

WEST'S IMPROVED PUMP.

Anti-Freezing, Double-Acting, Forcing, and Lifting.

These Pumps have now been in general use a number of years, and give better satisfaction than any other, and are recommended as

THE BEST!

by CAPTAIN ERICSSON and other eminent engineers. We can refer to thousands using them, and guarantee that all will recommend them. They are more simple in construction, and work easier, and cost less than all others.

"Our readers will find the double acting, improved pump of J. D. West & Co., one of the best in the market. It is very simple, works to a charm, so that any child may use it; throws a steady continuous stream, and does not freeze in the coldest exposures, and is unusually cheap. We say this knowingly, and give the testimony of our own accord, without the knowledge or request of the proprietors."—*New York Evening Post, July 1st*, 1863.

"J. D. WEST & Co.: We are pleased to state that the Pumps we had of you about a year ago, have been in constant use, twelve hours each day, and raise for the use of our woolen factory, about 130 gallons per minute. They work with but little power, compared with pumps we have used before, and do not get out of repair, and are satisfactory in all respects.

"DUNLAP MANUFACTURING CO."

Solon Robinson to the Farmers' Club.

Jan. 23.

"No farmer who owns a well or cistern can possibly afford to be without an iron pump. It should be at once a suction and force pump—a perfect little fire engine—such a one known as 'West's Improved Pump.' I speak of this Pump because I happen to know it....to be very simple, durable, powerful and cheap, and it don't freeze up, nor get out of order once a year....I know this, and think I may be doing the farmers good by speaking of it....A boy ten years old can work it, and throw a continuous inch-and-a-quarter stream....It can be made to work in deep wells as well as in shallow ones."

"GREAT NECK, L. I., 1860.

"I have used this Pump for one summer and winter, exposed to the northwest wind coming over Long Island Sound, being the coldest possible exposure, and at no time did it freeze, nor were we unable at any time to pump water with great ease.

H. B. MC ILVAIN."

"The undersigned having to use "West's Improved Pumps," cheerfully recommend them as simple, durable, and powerful in raising and throwing water, and for their ease of action, security against frost, and low price, we believe them superior to all others.

"WARREN LELAND, Met. Hotel, N. Y.
"J. W. POMEROY, Yonkers, N. Y.
"JOHN MESEREAU, N. Y.
"DOMINICK LAWRENCE, Westchester."

From the New York Observer.

"We have had in use for months past one of West's Pumps, which has given us more satisfaction as a force and lifting pump than any we have ever used. It is one of great power, and well adapted for ship's decks, mines, factories, greenhouses, graperies, etc. *The Mining Chronicle and Railway Journal* says: 'It is recommended for its extreme simplicity of construction, great strength, and consequent durability and cheapness of repair. There is no stuffing-box—the pressure being held by a cup packing, like that upon the working-piston, working in a cylinder, fitted for the purpose within the upper air chamber—which we think a great improvement, as stuffing is so liable to be deranged and leak under strong pressure, to say nothing of the loss by friction incident thereto. It has also two air-chambers; thus the action of the valve is cushioned upon both sides by air—preventing water-hammer and vacuum-thump. The valves are very accessible and simply and cheaply repaired. They work much easier than any pump we have ever seen; the 4-inch cylinder being worked by children in wells 100 feet deep, and as they are extremely cheap, as well as simple and strong, we freely recommend them.'"

"CAMBRIDGE MINE, N. C., June 15, 1868.

"J. D. WEST & Co.—Gents: The Pump which I ordered for our mine is received, and put to work in our underlay shaft, which we are sinking. We find that one man will, with ease, lift 50 gallons per minute. We lifted in three and a half hours all the water in the shaft, which measures seven by twelve feet and thirty feet deep, and it was full when we commenced. It answers our expectations in every respect, and our workmen are highly pleased with it. It will do great service with but trifling expense for repairs.

"Yours, respectfully, BURR HIGGINS."

"This may certify, that I have been using, at my manufactory, for the last four years, 'West's Improved Pumps.' I now have in use three of said Pumps, one of which is kept constantly at work, 24 hours of each day (save Sundays), and has been running for the past two years. I pronounce them, unhesitatingly, the best Pumps that have been brought to my notice, having used many others previously. They are simple in their construction, and not easily disarranged.

"N. Y., Oct. 10, 1859. JAS. A. WEBB."

We have plenty more such certificates, but think these are enough. For Pumps, Hose, Pipe, etc., address or call upon

J. D. WEST & CO., 179 Broadway, New York.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway.

AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS,

At prices within the reach of every Church, School, Cemetery, Factory, or Farm in the land. Their use throughout the United States and Canadas for the past six years has proven them to combine most valuable qualities. Among which are TONE, STRENGTH, SONOROUSNESS, and DURABILITY OF VIBRATION, unequalled by any other manufacture. Sizes from 15 to 5,000 lbs., costing TWO-THIRDS LESS than other metal, or 25 cents per pound, at which price I warrant them twelve months. Old bell metal taken in exchange, or bought for cash. Send for a circular to the manufacturer,

JOHN B. ROBINSON,

No. 36 DEY STREET, NEW YORK.

List of Academy, Steamboat, Fire-alarm, and Church Bells, with particulars as to Weight, Sizes, Price of Bells, Hangings, etc.

Weight of Bells.	Diameter.	Price of Bells without Hangings.	Price of Patent Hangings.	Price of Bell and Hangings complete.
225 lbs.	26 inches.	$56 00	$15 00	$71 00
275 "	29 "	69 00	18 00	87 00
375 "	32 "	94 00	22 00	116 00
450 "	34 "	112 00	25 00	137 00
600 "	36 "	150 00	30 00	180 00
750 "	40 "	188 00	35 00	225 00
1,000 "	46 "	250 00	42 00	292 00
1,200 "	48 "	300 00	45 00	345 00
1,400 "	50 "	350 00	50 00	400 00
1,600 "	52 "	400 00	54 00	454 00
1,800 "	55 "	450 00	60 00	510 00
2,000 "	58 "	500 00	62 00	562 00
2,500 "	60 "	625 00	72 00	697 00
3,000 "	63 "	750 00	85 00	835 00
3,500 "	66 "	875 00	87 00	962 00
4,000 "	69 "	1,000 00	100 00	1,100 00
4,500 "	72 "	1,125 00	115 00	1,238 00
5,000 "	75 "	1,250 00	125 00	1,375 00

LILLIE'S
CELEBRATED
Chilled and Wrought Iron Safes,
WROUGHT IRON FIRE-PROOFS,
LOCKS AND VAULT DOORS.

These Fire-Proofs are manufactured to supply a demand for Security Against Fire, less expensive than my celebrated and superior Chilled and Wrought Iron Burglar and Fire-Proof Safes.

They furnish similar and equal security to the Safes generally manufactured in the different cities, but are SUPERIOR to them in their Fire-Proof qualities and durability, the iron being effectually protected from rust in any climate, and the Fire-proof not subject to lose its utility by age. This is an important advantage gained to the purchaser, as Safes often rust out and become worthless in two or three years.

To substantiate my position, those purchasing these Fire-Proofs are at liberty, by giving me due notice of time and place of trial, to test them by fire with any other Safe of the same size; and should they not prove superior, I will refund the money, or a new Fire-Proof, as the purchaser may decide.

LIST OF SIZES & PRICES OF WROUGHT IRON FIRE-PROOFS.

	Outside.			Inside.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
6	40	31	27	31	21	15	$150
5	34	21	26	24	21	14	125
4	31	27	25	22	18	13	110
3	30	24	24	21	15	12	100
2	28	22	23	20	14	12	75
1	24	19	20	17	11	10	50

Sample of Fire-Proof Safe at Office of the Am. Ad. Agency, 389 Broadway, N. Y.

PRICE LIST.
LILLIE'S CELEBRATED CHILLED & WROUGHT IRON SAFES.

BANK, FIRE, AND BURGLAR SAFES.
Folding Doors, D Lock.

OUTSIDE.				INSIDE.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
	In.	In.	In.	In.	In.	In.	
1	66	50	29	54½	39	18	$950
1½	59	50	26	48	39	15	800
2	53	44	27	42½	33	15	600

MERCANTILE F AND B SAFES.
Folding Doors and Monitor Locks.

3	50	42	27	40	32	16	$500
4	46	42	27	36	32	16	450
4½	38	46	27	28	36	16	450
5	42	38	27	31½	27½	15	350

Single Doors and M. Lock.

6	38	35	26	27⅛	23¼	15	$250
7	34	31	26	24	21	14	200
8	31	28	24	21	18	13	175
9	30	24	24	21	15	12	140
10	26	22	22	19⅛	13½	12	120
11	24	20	18	17	17	10	100

HOUSE SAFES.

SIDE BOARD		$600
DINING ROOM		350
PANTRY (No. 1)		275
PANTRY (No. 2)		150
DUODECAGON BANK LOCK		100
MONITOR SAFE	do.	50
SAFE	do.	10

NATIONAL BANK SAFES,
With 2 Inside Burglars and 1 D and 2 M Locks.

OUTSIDE.				INSIDE.			
No.	Height.	Width.	Depth.	Height.	Width.	Depth.	Price.
	In.	In.	In.	In.	In.	In.	
1	68	53	35	55	39	18	$1,200
2	61	53	35	48	39	18	1,050
3	57	47	35	42½	33	18	900

BANK VAULT BURGLAR SAFES,
With Folding Doors and D Lock.

0	68	53	27	64	48	20	$1,000
0½	61	53	27	55	46	20	800
1	57	47	27	49	40	20	600

BANK VAULT BURGLAR SAFES,
Single Doors and D Lock.

2	53	32	26	49	25	19	$450
3	42	36	22	38	32	18	400
4	36	31	20	32	27	16	350
5	30	24	18	26	20	14	250

BANK VAULT DOORS AND FRAMES,
D and S Lock.

No.	Height clear.	Width clear.	Depth adjustable.	Price.	Weight.
	In.	In.	In.		
1	72	27	20	$400	3,000
2	72	27	20	275	1,500

Orders received and filled at net cash prices, by the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York. All Safes shipped from Troy free of cartage.

Business Depart., E. ALVORD. *Corresponding Depart.*, FOWLER AND WELLS.

List of Prices, Weights, and Sizes of Farm, Hotel, Steamboat, Schoolhouse, Shop, and Factory Bell.

These Bells are fitted with Yoke, Standard's Crank and Bolt, complete for use.

Weight of Bell and Hangings.	Diameter.	Cost of Bell and Hangings complete.
15 lbs.	7 inches.	$3 75
20 "	8¼ "	5 00
35 "	10 "	8 75
50 "	12 "	12 50
75 "	14 "	18 75
100 "	18 "	25 00
150 "	20 "	37 50
200 "	22 "	50 00
250 "	24 "	62 50

Larger Sizes made to Order at 25 cents per pound.

Guarantee.—All Bells sold at the above prices WARRANTED against breakage by fair ringing, for TWELVE MONTHS from time of purchasing. Should one fail, a new bell will be given by returning the broken one.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York.

In case a Bell breaks after the expiration of the Warrantee, I allow HALF PRICE for the old metal. JOHN B. ROBINSON, 36 Dey Street, N. Y.

WILLCOX & GIBBS SEWING MACHINE

It is entirely noiseless.

A patented device prevents it being turned backward.

The needle cannot be set wrong.

It received the Gold Medal of the American Institute in 1863.

Send for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

JAMES WILLCOX,
Manufacturer, 508 Broadway, New York.

Principal Offices:

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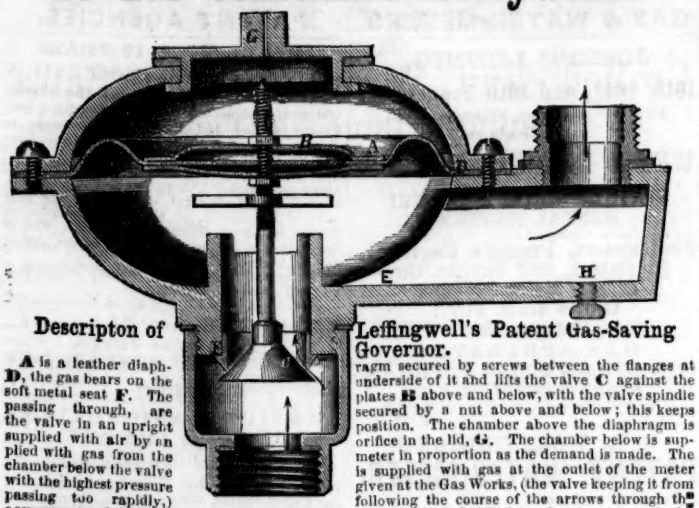
BOSTON—232 Washington street.
PHILADELPHIA—715 Chestnut street.
CHICAGO—133 Lake street.
CINCINNATI—70 West 4th street.
LONDON—135 Regent street.
HAMBURG—44 Hermann street.
PARIS—92 Boulevard de Sebastopol.
ST. PETERSBURGH—15 Gorochovay.
VIENNA—9 Wildpretmarket.
BRUSSELS—12 Rue Croisade.
SYDNEY, AUSTRALIA—292 Pitt street.

To Gas Consumers Everywhere.



Descripton of Leffingwell's Patent Gas-Saving Governor.

A is a leather diaphragm secured by screws between the flanges at **D**, the gas bears on the underside of it and lifts the valve **C** against the soft metal seat **F**. The plates **B** above and below, with the valve spindle passing through, are secured by a nut above and below; this keeps the valve in an upright position. The chamber above the diaphragm is supplied with air by an orifice in the lid, **G**. The chamber below is supplied with gas from the meter in proportion as the demand is made. The chamber below the valve is supplied with gas at the outlet of the meter with the highest pressure given at the Gas Works, (the valve keeping it from passing too rapidly,) following the course of the arrows through the governor to the outlet where the distribution pipe is connected. **E** is a chamber to catch the drip, **H** is the outlet of said chamber, at which point, if the drip troubles its action, a syphon is attached which carries it off.

STURGES & FROST, (MANUFACTURERS AND PROPRIETORS FOR THE UNITED STATES OF LEFFINGWELL'S PATENT GAS-SAVING GOVERNOR,) solicit attention to the above instrumen which the cut represents. It will positively lessen your gas consumption **15 to 40 per cent** without diminishing, but greatly improving, the light, which is done entirely on scientific principles easily comprehended.

The above facts are demonstrated by thousands of consumers who have them in practical operation in different parts of the Union. By sending two three cent postage stamps to the proprietors, No. 9 Mechanic Street, Newark, N. J., the GAS CONSUMERS MANUAL will be sent, containing price of the above Governor, full information with regard to the waste of gas, its causes and how remedied, an almanac for the years of 1864-5-6 and 7; also, a diary suitable for any year, together with certificates and references of many who have the Governors in use.

Try it by all means, it will not fail you.

Each Governor is Warranted Perfect.

STURGES & FROST.

☞ As no QUICKSILVER is used, Gas Companies will find it to their interest to favor its adoption among their consumers.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though sold at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, rouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Four Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agents—S. R. WILLIAMS, 204 South Front st., Philadelphia.
CALVIN GAY, 29 Doane st., Boston.

THE
STANDARD
Gold Company
OF COLORADO.

DIRECTORS,
ROBERT BOWNE,
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President, ROBERT BOWNE.
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MINES on FISK LODE,
BOBTAIL LODE,
GROUND HOG LODE,
ENTERPRISE LODE,
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In all, 8,625 feet (linear), and large water powers and mill sites.

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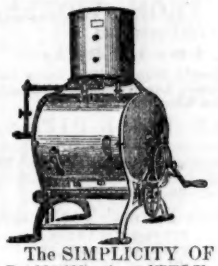

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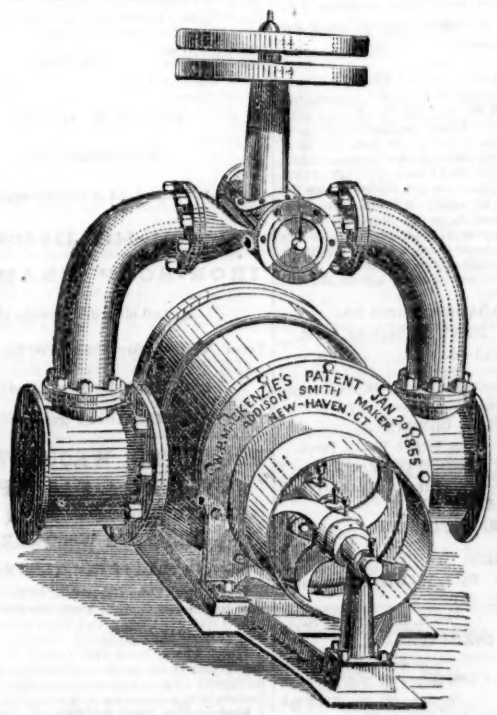

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This Coffee is prepared under a formula from the great German chemist,

PROFESSOR LEIBIG,

and gives the essential full strength and delicious flavor of OLD GOVERNMENT JAVA COFFEE, which is the only quality of Coffee used in its preparation, without any of that narcotic quality which so sadly damages the nervous system in the use of even the best grades of Coffee as ordinarily prepared.

2d. It gives the essential tonic and diuretic elements of Dandelion, without the "hereby," coarse taste so disgusting, and yet always found in the ordinary Dandelion Coffee.

It is known to all acquainted with chemistry, that the essence, or oil, or whatever name may be given it, when properly and scientifically obtained from any herb or plant, is a far different article from that produced by putting that plant into water and boiling it out—permitting the escape of the most exquisite and reliable strength and leaving the coarse and earthy drugs precipitated or in solution.

So this preparation combines the exquisite aroma of the Java Coffee, with the highest essential excellence of the most choice Dandelion—yielding the spirit without the grosser earthy body of both; thereby avoiding the deleterious effects of both and becoming at the same time

The most Delicious Beverage

AND THE

Most Health-giving and Restoring Drink

Known in the world—being at once a sovereign remedy instead of producer of

Dyspepsia and General Nervous Debility,
Flatulence, Fulness of the Head,
Dizziness, Costiveness, and
diseases of the Liver
and Kidneys,

because of its great Tonic and Diuretic qualities.

The simple fact that the preparation is from Baron Leibig, will commend it to the attention of the scientific in all parts of the country, while the use of it will at once and permanently prove to the masses everywhere that it is the long-needed desideratum—in its way.

The immense popularity of this Coffee in the Old World is an earnest that its use and popularity in America is bound to become continent wide.

Another consideration not to be overlooked in regard to the matter, is that

It Costs Less than Ordinary Green Coffee.

And requires less than half the quantity to give the same degree of strength, and its use proves it at 30 cents a pound to be cheaper than Maricaibo coffee at 15 cents a pound.

Neatly packed in pound papers, with full instructions for use on each label—in SIXTY POUND BOXES. Price, 30 cents per pound. A liberal discount to the trade.

Manufactured by the PEOPLE'S PROVISION CO., 268 Greenwich street, N. Y., to whom al orders may be addressed.

Sold by wholesale Grocers and Druggists.

Glycerin for Gas Meters.

This article is superior to any fluid ever before used for Wet Meters, and we cannot better set forth its advantages than by giving the following letter from the Superintendent of the Covington Gas Co. The superiority of our Glycerin over all others in the market, for this purpose, is admitted by every Company that has used it. We have sold, the past winter, to the Cincinnati Gas-Light and Coke Co.; to the Gas Companies of Covington, Ky.; Dayton, Springfield, Portsmouth, Urbana, and Piqua, Ohio Richmond, Ind., and Buffalo, N. Y, to whom we refer.

Glycerin is much cheaper than Whisky is now, or likely to be hereafter, and not evaporating, greatly increases the economy of its use.

OFFICE OF THE COVINGTON GAS-LIGHT CO.
COVINGTON, KY., Feb. 18, 1864.

MESSRS. W. J. M. GORDON & CO.:

Dear Sirs,—It affords us great pleasure in testifying to the superiority of the Glycerin Fluid purchased from you for filling the Wet Meters now in use by the Covington Gas-Light Company.

The difficulty of finding a non-evaporating and anti-freezing mixture for Wet Meters, has, in my opinion, been overcome by the use of your Glycerin Fluid.

I have had it in constant use for the past four months, and during that period the thermometer has ranged as low as 14° below zero, and after careful examination, I have found the fluid in the same condition as when first put in the Meters, and without the slightest discoloration.

Its non-evaporating quality does away with the hitherto unavoidable expense of filling the Meters monthly, and renders Wet Meters no longer objectionable.

In fact, I can cheerfully recommend it as being cheaper and better than any other Fluid or Mixture now in use.

Very respectfully,
S. S. STRATTON, *Sup't Cov. Gas Co.*

We have been engaged in Manufacturing Glycerin the past six years, and from our advantage in material and the large amount we make, are enabled to offer it lower than any manufacturer in this country. We will be pleased to quote prices or to give further information.

W. J. M. GORDON & BRO.,
MANUFACTURING
CHEMISTS & DRUGGISTS,
N. E. Cor. Central Avenue & Eighth St.,
Laboratory, Miami Canal, bet. Third & Fifth Sts.,
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HERT'S & CO'S
AMALGAMATED
ALUMINUM, ZINC AND PLATINA
PENS.
WARRANTED ANTI-CORROSIVE.

In introducing this invention, Messrs. HERTS & Co. beg to call attention to the following advantages combined in these Pens:

They possess the Anti-corrosive properties of the Gold Pen.
The Freedom of the Quill, and
The Flexibility of the Steel Pen.

Thus *combining* in *themselves* every advantage found in other pens; and by their anti-corrosive properties entirely obviating all the objections hitherto existing against the use of Metallic Pens.

Another advantage peculiar to these Pens, is that they *improve* after being a *short time in use*, and may be left in the ink without fear of injury, as they *never need wiping*.

THE No. 808 "medium points," are adapted for *office use* and *general business purposes*.

THE No. 909 "extra fine points," are adapted for *Ledger, Heading, Posting, Engrossing, Ladies and School use*.

The undersigned have given HERTS & Co's Pens a trial, and are satisfied to recommend them to the general public.
FOWLER & WELLS.

Manufactory, Bradford Works, Birmingham,
ENGLAND.

Orders for the United States, Canada, South America, and the West Indies, must be addressed to

H. B. HERTS, 52 John St, New York,
SOLE CONSIGNEE.

from whom samples may be obtained *gratis*, on application by mail or personally.

The Am. Advg. Agency, 389 Broadway, N. Y., will receive orders for the above-named Pens.

New York, April 18th, 1864.

* * * * * *

We respectfully invite your attention to and consideration of the justly celebrated and reliable remedy for DYSPEPSIA, HEARTBURN, DEBILITY and PROSTRATION. The Proprietors are proud to acknowledge the unparalleled success which has attended the sale of their valuable preparation, known in nearly every portion of the civilized world as the

"GOLDEN BITTERS."

We risk nothing when we term them a *valuable preparation*, for they are one of the few articles of the present day which are not a humbug; and we are willing and able to satisfy any person or persons who will call upon us, that the celebrated "GOLDEN BITTERS" are a genuine *bona-fide hygienic* article. It is the wish of the proprietors that the virtue of the article be tested before condemning. A decision of their merits by any one who has tried them, is worth a million of purchased bogus testimonials.

For Creating a Healthy Appetite

they are invaluable, and are unequalled as a TONIC. They are mild in their action, and operate by giving *vigor* and *strength* to the system,—not by any change they produce in the solids, but through the medium of the living principle.

They are Purely Vegetable,

being composed of Gentian Root, Calamus, Sassafras, and many other remedial agents of the Vegetable world, all preserved in Jamaica Rum and Sherry Wine.

As a Beverage

They are the most *wholesome, invigorating* and *palatable* stimulant ever offered to the public And the fact of their being prepared chemically and scientifically, precludes the possibility of a bitter, unpleasant taste, common to Bitters generally offered for sale. We especially recommend them to LADIES, and particularly to those suffering from

DEBILITY, WEAKNESS, AND PROSTRATION.

Half a wine glass of these "Bitters" three or four times a day, will produce a remarkable healthy change in persons greatly debilitated.

The "Golden Bitters" have been tried and not found wanting. They are put up in our own *Patent* quart bottles, and for sale by Druggists, Grocers, &c., throughout the world. Each bottle bears a fac-simile of the signature of Hubbel & Co.

GEO. C. HUBBEL & Co., Sole Proprietors.
CENTRAL DEPOT, American Exp. Building, New York.

THE GOLDEN BITTERS.—We are not an advocate of stimulants of an alcoholic character; indeed we deprecate this "daily tonic" idea—this "morning toddy" which we see offered in all sorts of shapes as a recuperator, invigorator, revitalizer, &c. As a rule all artificial stimulants are dangerous remedies, and must be taken into the system as you would mercury or arsenic, in very small doses. But we have had an opportunity to try the now well-advertised article known as Hubbel's Golden Bitters, and are frank to say that where the system needs building up, where a stimulant is required to aid nature in restoring a lost appetite and infusing a vigorous action to the debilitated functions, we can recommend these Bitters. Hubbel's Golden Bitters are evidently intended to improve the debilitated human system, rather than to tickle the palate, and are, therefore a harmless and safe remedy o keep in the house.—*New York Weekly Day Book.*

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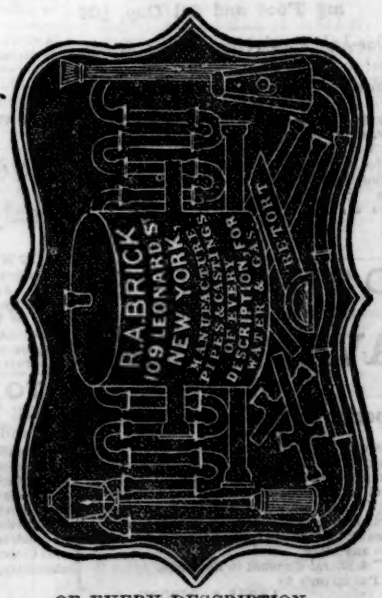

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